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AUGUST, 1948
35 CENTS

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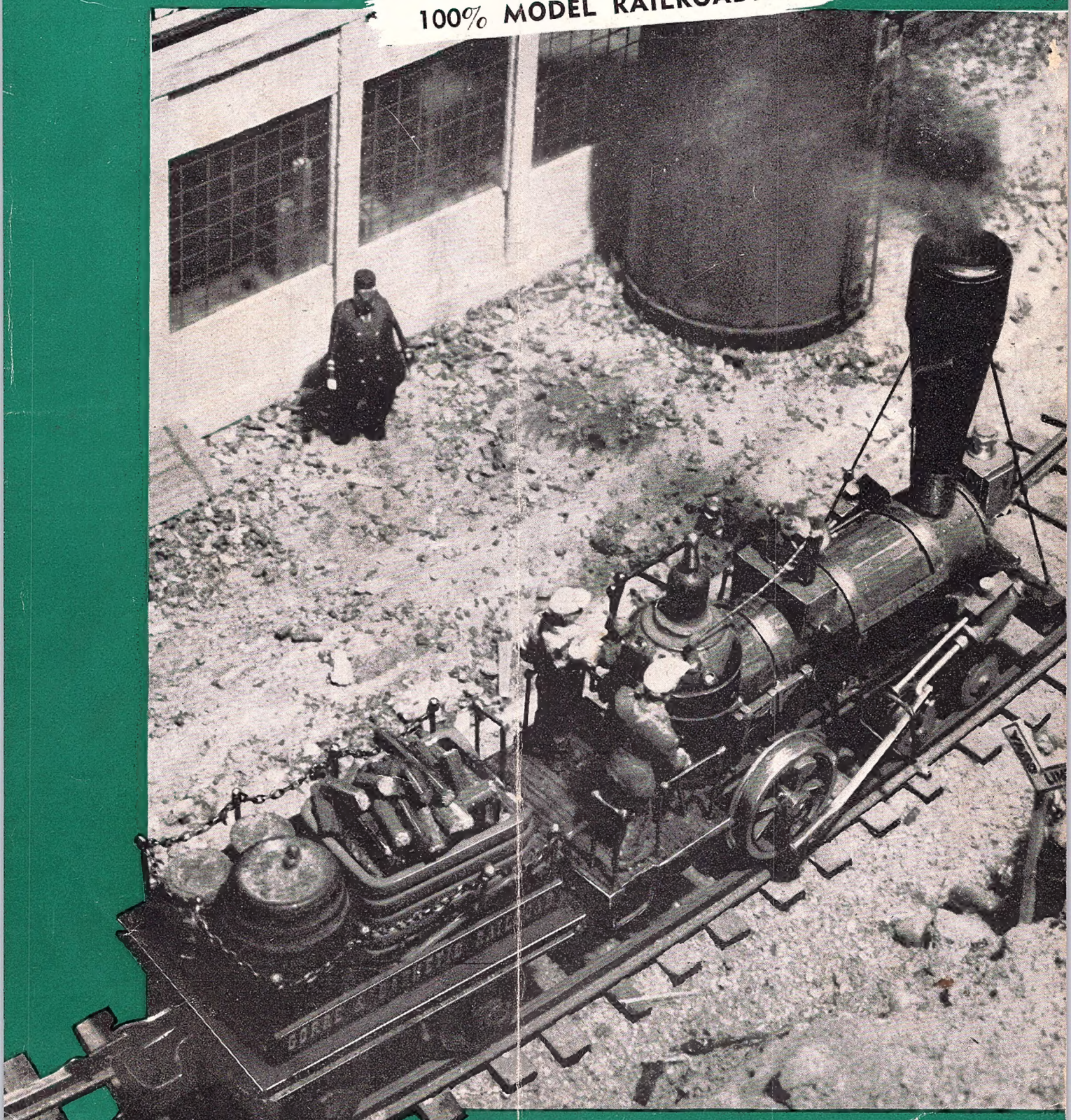

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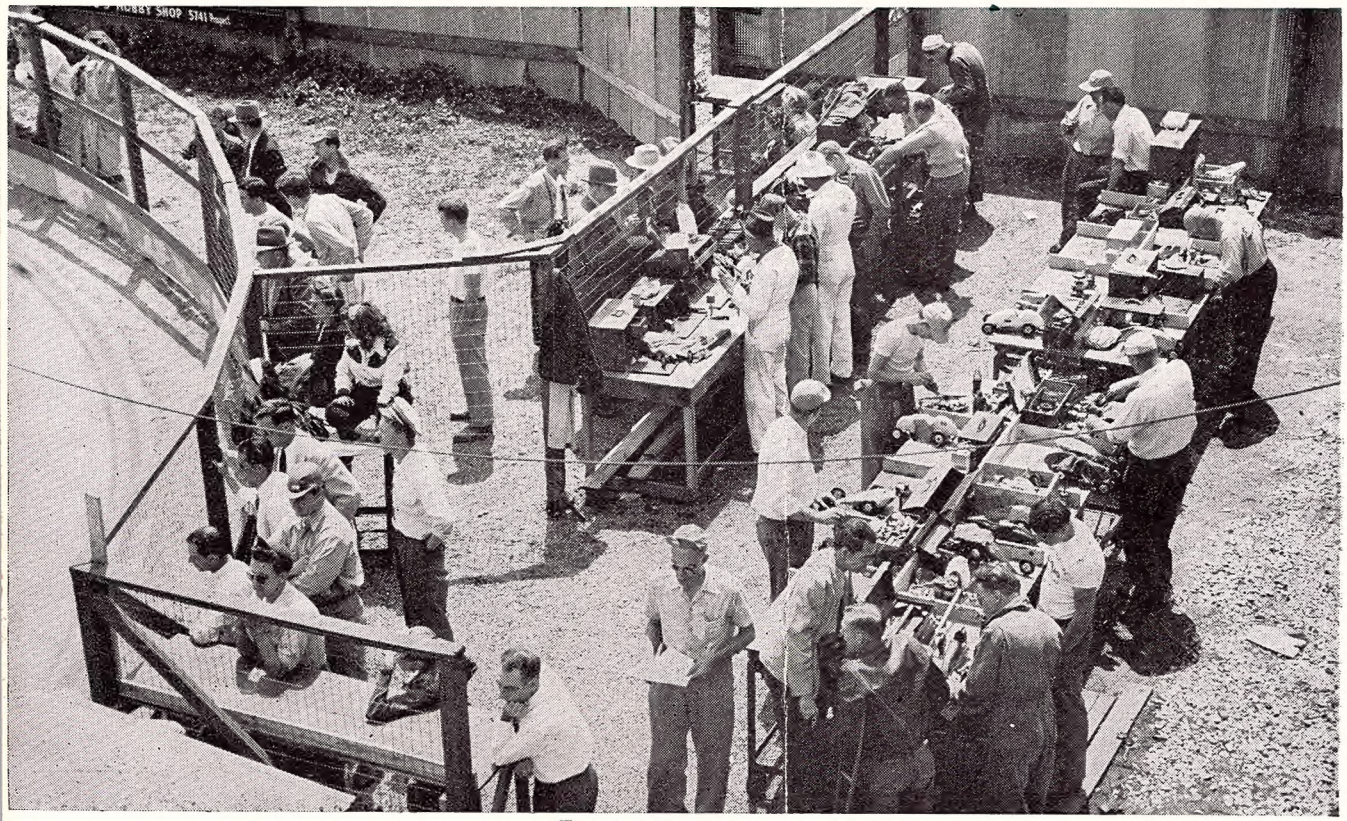

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THE MODEL CRAFTSMAN

Vol. 17, No. 3 August, 1948

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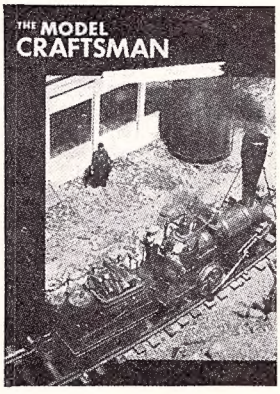

The "C. D. Grant" No. 20 loco of the HO gage G. D. line built by John Allen of Monterey, California. This loco is being readied to take part in the Gorre & Daphetid's 25th Anniversary Celebration. If you are wondering about that 25th Anniversary remember that G. D. lines run on 12 to 1 scale time.

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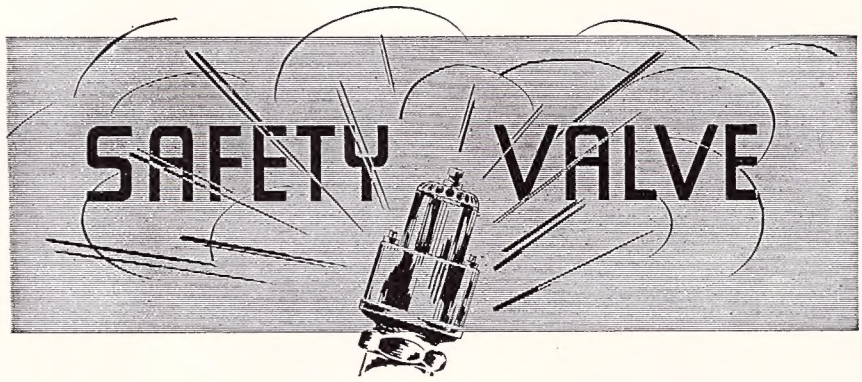

NO MONOPOLIES PLEASE

I have just finished rereading the "Safety Valve" in your June issue and just want to second some of the remarks made by a fellow model railroader, Milton Herbert.

What the country used to need was a good 5c cigar. Now we need a good Model Railroad magazine and I feel that you are providing just that and doing a swell job of it. I never did believe in monopolies and still don't. I am modeling in "OO" so naturally more articles and pictures on "OO" would be welcome. Keep up your fine work . . . . Dean Wilson, Rockford, Ill.

A FARMER VIEWS TINPLATE

Am sending you my renewal for your magazine which I hope to be able to continue to receive. My particular interest is in Tinplate trains which in the past were quite well represented in "O" gauge by Lionel and American Flyer but this representation now seems to be decreasing.

To me American Flyer discarding of all "O" gauge has come as a d sappointment which the Lionel conversion to nearly scale models does not replace. Neither does the Marx $\frac{3}{16}$ O gauge supply an adequate substitute for the Chicago made American Flyer. I have AF models now nearly 18 years old which is not old in comparison with the time Miniature trains have been made. However, it is after all only reasonable for changes to be made in miniature trains just as have happened in most other things.

A definite example of this is in the Farming business which I am now doing. Previously to my leaving the farm work to care for the local county telephone system, the farm work was done slower and with horses. This year I have put out a corn crop of 70 acres with only one tractor with my father to help, and no horses on the farm. The farming seems much different this time and some ways is easier, though—I do not like the noise from the tractor and really I could set Class 9 20 foot poles alone almost as easy as listening to the tractor . . . . Robert Saxon, Connersville, Indiana.

LOST PLANS

After a lapse of several years, I recently purchased several copies of the Model Craftsman. I was very much pleased to see the return of an all railroad Craftsman and was about to enter a new subscription when lo and behold a steam engine by Lindsay!!

I'm a sucker for live steam engines so right away I start to build it. By the way, I have one single-cylinder built from plans in another magazine. After thumbing through the June issue several times, I find *no plans* for my engine. Would you guys *Please* p-l-e-a-s-e make up your mind! . . . Gilbert Dickman, Sidney, New York.

KEEN OBSERVER

Although I have been reading your magazine since 1940, this is the first time I have written to you about an error you have made in your magazine. This mistake, in the June, 1948 issue, cannot go uncorrected. On the cover you have a photograph of a 2-4-0, number 21. Inside, on the title page, you called this engine a Union Pacific locomotive. Actually, it is the Virginia and Trukee number 21, otherwise known as the J. W. Bowker. This locomotive was used in the movie "Union Pacific" which was the closest it ever came to this railroad so far as I know.

Incidentally, this same photo was used in an article on this locomotive published in your magazine in early 1939. The article included a ½" or 1" scale drawing of this loco. An interesting fact about this engine is the water pump for fire fighting work mounted on top of the boiler between the domes . . . . Russell Dougherty, Jr., Indianapolis, Ind.

IS RENAMING NECESSARY

The article "Kit of the Month" which has appeared in both the May and June issues of the Model Craftsman is just the type of article which I have been waiting for. Many thanks to you and the individual who suggested it. No finer article could have been inserted in your magazine. Don't ever stop it.

J. A. Giroux's letter which appeared in the June, 1948 issue of M. C. proved to be very interesting and his suggestion of renaming the magazine to "The Model Railroad Craftsman" is indeed worthy of consideration, as it is an appropriate name covering only model railroading, where as the present name is to "General" speaking —let's be specific.

I should like to see construction plans of a 600 H. P. Diesel Switcher as built by Electro-Motive Corp. or the Baldwin-Westinghouse 1000 H.P. Diesel Switcher in HO gauge. The article "Getting Started" by John Barkley is very timely—it's a swell article. John Barkley does a fine job. Your magazine is tops with me! . . Henry Ognenoff, Wichita, Kansas.

RAILROAD CLUB NEWS

WASHINGTON, D. C. Ed Henderer, Pres. of the Metropolitan Society of Model Engineers, announces that the miniature HO and O gauge club layouts, upon which the members have been working for more than a year, has progressed to such great extent that test operations are now being made. Ninety per cent of the track work—over 500 feet of miniature track laid to scale—is completed at club headquarters in Union Station.

Test operations on the double-track main stem were inaugurated recently before an enthusiastic audience of club members and friends. From level country at Crown Point, the terminus, the tracks of these small roads wind through hilly country which run swift streams. The small trains disappear into long realistic tunnels, rumble over high trestles and wind through deep cuts in the solid rock. The scenic effect in places is very reminiscent of the Western Rockies. The scenery building, equal to any other model road in the country, has been under the supervision of Al Schutz. He now reports that industries are already springing up along the right-of-way, coal deposits have been discovered and a mining concern, with its appropriate buildings, is already in operation. Oil has also been found in the mountain division, and the small oil derricks are soon to appear. Real estate values in Crown Point and in the other towns along the right-of-way have increased and building activities are already in evidence.

Photos above and below show the Washington Club layout nearing completion.

A traction company has been formed and is constructing a trolley line to connect Crown Point, Shanty Town and Stonehaven. Royston, second town of importance on the line, is a center of great activity. Here the main line of the Metropolitan Eastern connects with the mountain division and here also are located the temporary construction offices of the road.

Specially qualified crews have been appointed to install and maintain the intricate electrical work, the automatic switches and signal systems. Altogether some seventy switches and turnouts will be required; most of them are already in place and in operating condition due largely to the efforts of Dan Wade, Bill Fenton and H. A. McBride. All operation is on two-rail currents.

Club members are now building special locomotives and rolling stock for the particular needs of the system, and until this is in operation, suitable equipment will be loaned from various members' railroads. Traffic will be heavy and it is already obvious that the roads must contract for a considerable amount of modern equipment. Orders have already

(*Continued on page 48*)

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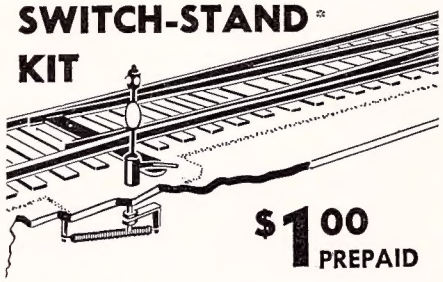

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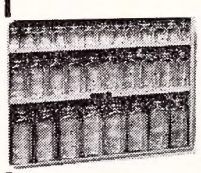

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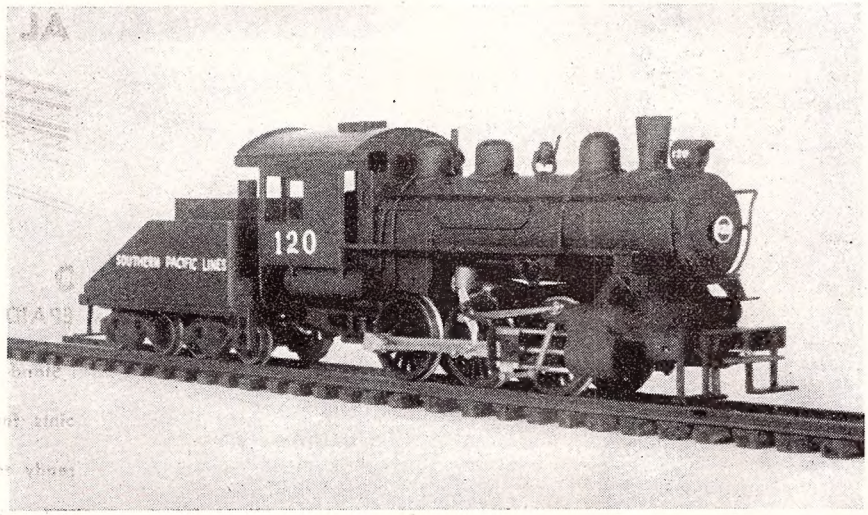


Southern Pacific 0-6-0 Switcher

PART I **By LEWIS AUSTIN**

THE Southern Pacific 0-6-0 Switcher is a very good prototype to model for it is pleasing in appearance and is also fairly typical of the many 0-6-0 switchers still used extensively throughout the country. The model is similar to the 0-6-0 Roundhouse switcher kit that is on the market now. However, it is modeled after the modern 1200 class having piston valves and Walshaert valve gear.

The Roundhouse kit is modeled after the older 1100 class which had square "D" valves and inside valve gear. Many of the parts in the kit could be used to build the model, in fact, the kit itself could probably be altered to resemble the 1200 class of switchers. However, this article will deal strictly with building the locomotive up from scratch as I did. The only parts that were purchased were the drivers, gears, motor, tender trucks and couplers. The motor used in my model is a prewar 6 volt Mantua motor of the small type used in the Belle of the Eighties and other small locomotives of the Mantua line. This type of motor is no longer available but the new 12 volt Pittman motor used in the Mantua kits can be mounted in the same way as the older motor.

The model has 62½" Varney drivers which are 1/32" larger in diameter than they should be but this slight difference is hardly noticeable. The prototype has 57" drivers which are available if you wish to keep everything strictly to scale. My reason for using the larger drivers was that I happened to have them and I could see no point in buying new ones to correct such a slight error in scale. The drawings are made with the 62½" drivers to show the model as I built it. If you use 57" drivers, do not change the spacing of the axle slots, but space them 13/16" apart as the drawing shows. The advantage of this is that the axle slots will be spaced the same as the axle centers on the Varney Consolidation and Mikado which makes it possible to use Varney rods and valve gear if you find it hard to make these small parts yourself.

Start construction by making the frame out of ¼" by ½" brass. The axle slots are made first by drilling ⅛" holes $\frac{13}{16}$" apart as shown on the drawing. The holes are drilled close to the edge of the frame so clamp another piece of brass to that edge of the frame while drilling the holes. This will help to prevent the drill from going off. After the holes are drilled, saw and file the slots so that the axles can be dropped in place on the frame. The axle slots could also be milled in the frame with a ⅛" convex milling cutter if it is possible for you to have it done. After the axle slots are finished saw and file the frame to its finished shape as shown on the drawing. The openings in the rear end of the frame are not really necessary but they will add a great deal to the appearance of the model. In order to cut the openings, it will be necessary to drill and file out a large opening in the frame as shown in the top view. The small openings in the sides can then be drilled and filed to shape. The frame plug shown on the drawing is simply a piece of $\frac{1}{16}$" thick brass soldered in place in the large opening in the frame after the small openings in the sides are completed. The plug is necessary to strengthen the frame and also to have something to fasten the rear end of the motor to.

The front end of the frame has a ¼" slot filed in it to accomodate the Mantua automatic coupler pocket. If you use dummy couplers it will still be necessary to file the slot in order to maintain the correct coupler height from the rails. The slot is covered by the front deck plate.

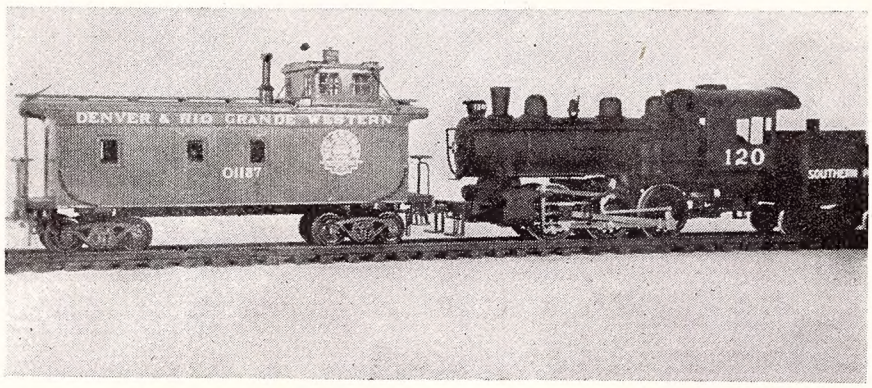
Before drilling the holes and filing the opening for the worm gear in the frame make the bottom plate out of ½" by $\frac{1}{16}$" brass. The plate is cut slightly oversize and then clamped in place on the frame. Drill the four #50 holes that are used to fasten the bottom plate to the frame. Then remove the clamp and open up the four holes in the bottom plate with a $\frac{3}{32}$" drill. The holes in the frame are tapped 2-56. Fasten the bottom plate to the frame and drill and file out the opening for the worm gear. Then file the rear end of the bottom plate so that it blends with the angle on the rear end of the frame. When this is done drill and tap the remaining holes shown on the drawing and the frame is completed.

The pilot beam is simply a piece of brass with a cutout in it to clear the coupler pocket. Solder the coupler pocket in place first before mounting the pilot beam. Be sure that you mount the coupler pocket so that it will project out about $\frac{1}{32}$" when the pilot beam is in place.

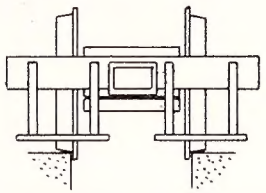
The steps are cut out of $\frac{1}{32}$" sheet brass to the shape shown on the drawing. Bend the steps to the shape shown on the side view of the assembled chassis. The pilot beam can then be soldered in place on the frame and the steps soldered to the pilot beam.

The Mantua automatic coupler will have to be altered slightly so that it can be mounted on the loco frame. First discard the wood screws that are supplied with the couplers and tap the hole at the rear of the coupler pocket with a 2-56 tap. The

(*Continued on page* 50)

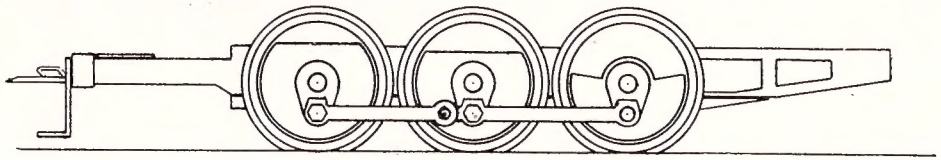


SOUTHERN PACIFIC 0-6-0 SWITCHER



FRONT VIEW

DRAWING IS FULL SIZE FOR HO GAUGE



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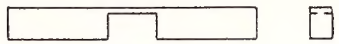
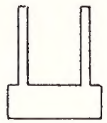
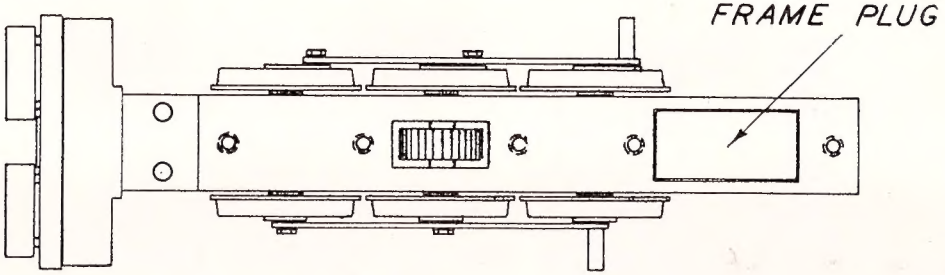


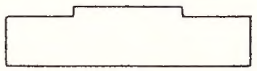
PILOT BEAM



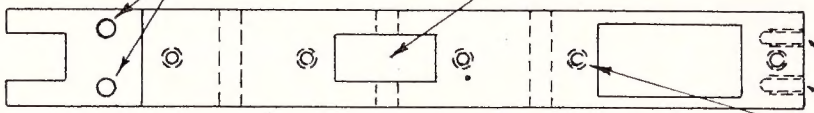
STEP TEMPLATE



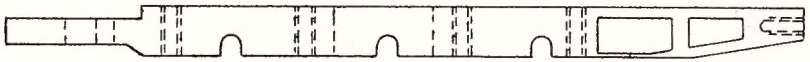
FRAME PLUG

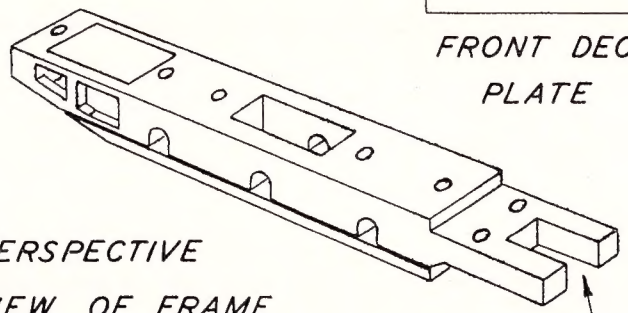


FRONT DECK PLATE



FRAME DETAIL

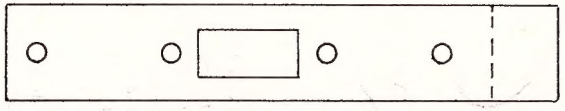




PERSPECTIVE VIEW OF FRAME NOT TO SCALE

CUTOUT FOR COUPLER POCKET

BOTTOM PLATE



L. AUSTIN

THE LAYOUT DOCTOR

Want to receive helpful suggestions on your layout — criticisms that will add untold realism to your model road? Send in a sketch to the "Doctor" — he will help to solve your problems. Layout sketches accompanied with photos will get first consideration.

BEN WEBB & Ray Marshall, of Ottawa, Ontario, have submitted their HO layout problem to the doctor for advice. They now have a line in operation, approximately six by ten feet, the plan of which is shown. With expanding operations, they are enlarging their motive power stud to include larger engines and fear that there will be trouble at the curves, which as you can see, range as low as sixteen inch radius on the main line. To this end, Webb, in whose house the trackage is located, "Talked things over" with his *better half* as all good model railroad fans do, and was able to secure some additional right-of-way, the dimensions of which are also given in the diagram.

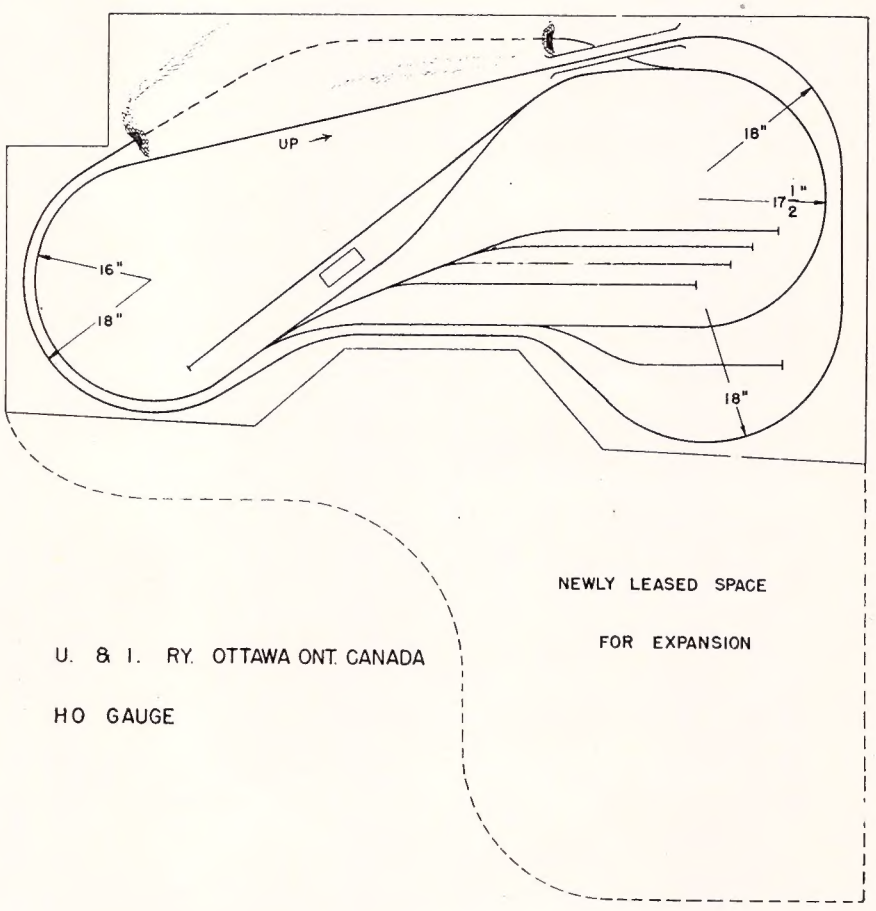
The original layout seems about hopeless for enlarging into the additional area as long as the curves are as small as they are. In fact, all that could be retained would be the tunnel and bridge back against the wall, so Brothers Webb and Marshall might as well junk the whole trackage. That's what the Layout Doctor did and came up with the revised plan given here which does, incidentally, retain the germ of the original layout—the ol' inside out figure eight.

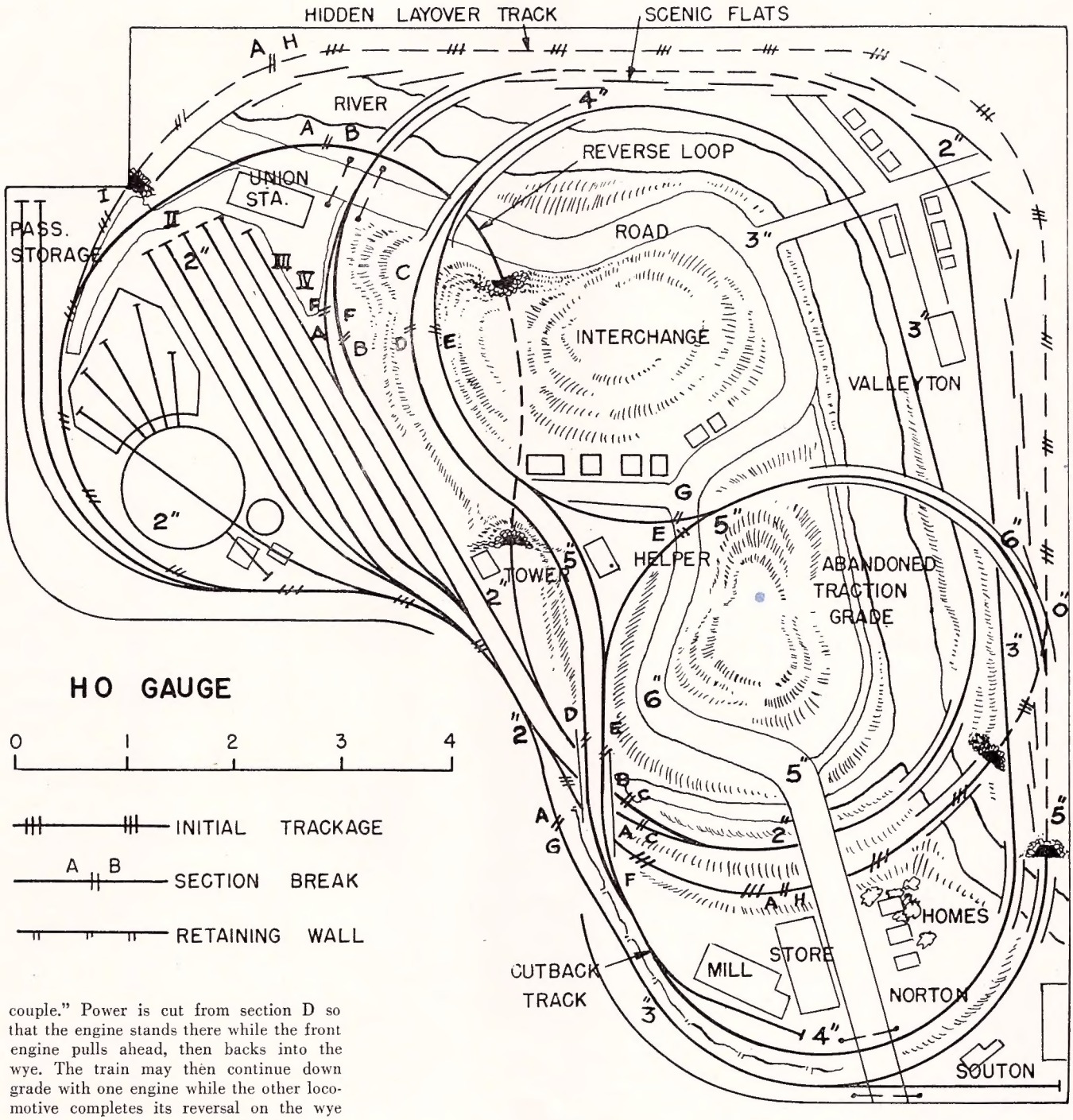
Let us take a trip around this new U.&I.R.R. (as the boys affectionately call it) in Warren Crater's inspection engine which has been conveniently shrunk down to HO size for the occasion. The engine has steam up and lies at short platform III of the Union Depot at upper left. When we have all climbed aboard, we head out the main line in a counter clockwise direction, keeping to the right at the maze of switches at the throat of the yard. We follow a little stream, duck under a highway bridge, over a larger stream and head up the tangent through the river valley. The first stop is a hamlet bearing the imaginative name of Valleyton which is also served by another railroad, (see the track) and two bus lines. The track has been climbing a 1½% grade which here increases to two percent. We cross the river again and take siding at another imaginatively named hamlet, Helper, where we see a wye to our right for turning helper engines. After leaving Helper, the track starts down grade again on about a two percent, making a stop at Norton. Later, farther down the grade we pass through Valleytown on that "other railroad" but do not stop until we are again back at the Union Depot, platform IV.

At this point, the photographers for the picture magazines drop off, but not the dyed-in-the-wool model railroad fan trippers. So off chugs our inspection engine again, but at the throat of the yards it takes the first switch to the right on to what is called a "Cutback track." This has a grade of three percent as it passes through Souton Station and comes out at the stem of the wye at Helper. Our engine takes the right leg of the wye and heads down grade through Valleyton. Just under the highway bridge, one rabid fan tripper, who never gets enough, raps the engineer of the inspection engine on the noggin with a bung-starter and whistles in boogie-woogie beat to the towerman. So the engine instead of heading back into depot platform III whence it started, swings to the right and dips into a tunnel behind the tower. The engine then rounds the reverse loop past depot platform II where some of the wiser souls aboard drop off. But the engine, with a rabid fan tripper at the throttle is now headed back counter-clockwise and can go 'round and 'round until the tank runs dry.

In every-day operation, passenger trains will leave from platform II, although gas cars run from the short platform III and clockwise trains pass and stop at platform IV. Freights leave from one of the yard tracks but arriving freights must stand on the reverse loop by the turntable until broken up.

This layout has many possibilities for operation besides the obvious ones such as the route followed by the inspection engine. A freight may be double-headed up the grade, counterclockwise let's say, although it will work clockwise, too. At Helper, the train stops so that the front engine is in section F while the second engine is in section D. For automatic uncoupling, a ramp must be located here, but the site is convenient for a "hand un-





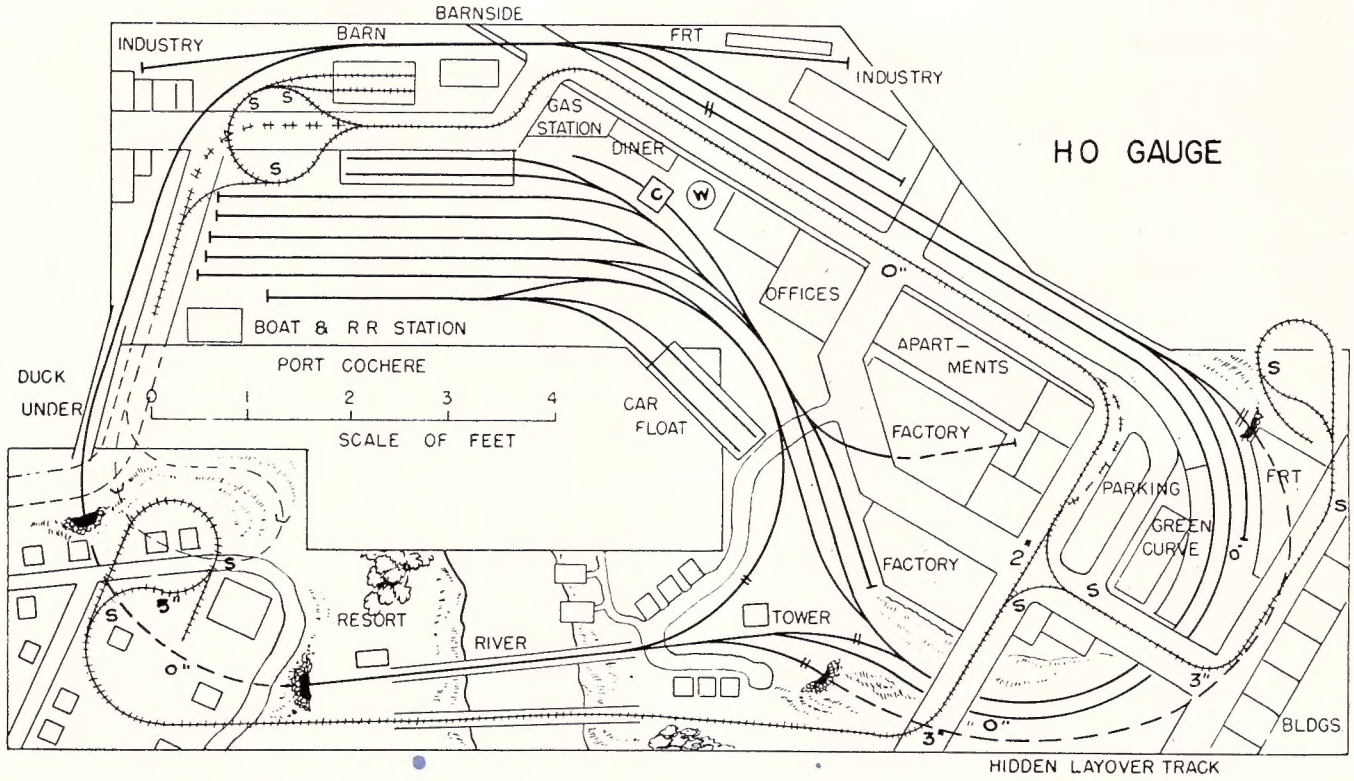
couple." Power is cut from section D so that the engine stands there while the front engine pulls ahead, then backs into the wye. The train may then continue down grade with one engine while the other locomotive completes its reversal on the wye and heads off down the grade whence it came and swings around the reverse loop ready to help the same train up the grade again when it arrives at Union Depot yards. The waiting helper engine would lurk under the highway bridge in section C while the train pulled up to the very end of section A or B, which would be dead while the helper backed on. Some time would be saved by backing the helper down the grade since then it would not have to be re-reversed at the foot of the hill.

Another possibility—a train of a few hopper cars leaves the yards and runs up the cutback track, leaving the cars on the stem of the wye while the engine pulls up onto the leg of the wye. The cars are later picked up by a passing main line train to bring it up to tonnage for the down-hill trip. Again empties set off at Helper can be brought down the cutback track by a helper engine and into the yards where they lose their identity. A similar service can be devised for passenger equipment with "the limited" dropping and picking up a sleeper at Helper and later doing the opposite with the (shhhh) same car at Union Depot. In either freight or passenger operation, that portion of the reverse loop in a tunnel may be utilized as a double ended interchange track where cars can be set out at one end and picked up at the other, common practice on real railroads but rare on models.

So far we haven't mentioned the hidden layover track, a feature which, if the Doc has anything to say about it, will be common on the model railroads of the future. Incidentally, the Doc does not take credit for inventing the hidden layover track. A whole train can disappear on to this track and appear at the other end scale hours later. Although it is shown with only one control section, H, it could well be divided into two or three sub-sections to hold more trains. If there were just a little more space, I would make this hidden track double, but have the switches outside the tunnel portals at the ends.

When it is clear, this hidden interchange track can be utilized for yet another variation in running. A through passenger or freight train makes the round of the hidden track setting out or picking up a Pullman or a few freight cars at the yards which are later used in a regular train over the road as previously described.

The minimum radius of this revised and enlarged U.&I.R.R. is twenty-two inches



(except for one mill siding) while most curves are twenty-four inches. The principal use of the 22″ radius is to swing parallel curved tracks together as at the throat of the small passenger storage tracks. However, the curve through Norton station is only 22″ because the width of the tablework there is only four foot-six inches. The curve could be made 24″ and the cut-back track 26″ (on the same center) but clearances would be slight and scenic treatment made difficult by the opposing grades of the closely packed tracks.

I have tried to keep switches within as easy as possible reach from the edge of the platform, since the plan does not mention any pop-up holes or access spaces. The wye switch at Helper is back about two and a half feet which is about as far as you will care to reach (I'll wager!). In this same connection, since making my final drawing, I believe that the passing track switch next to it on the higher level could be moved far enough toward Helper station to get it off the bridge although in this case the switch machine could be concealed in a wide abutment between road and river. So both of these switches could be made more accessible from the outside of the layout.

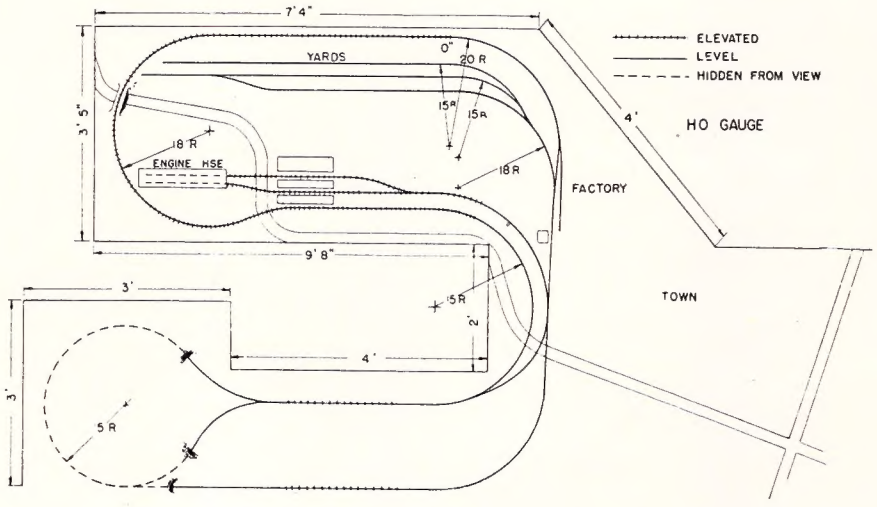
It would be interesting to know what Messrs. Webb and Marshall did on their old layout when they had to work on the switches, track or scenery back against the wall. Probably they just did a Gulliver and walked on the tablework. Well, they will probably have to do the same thing on this new table to work on Valleyton and envirions. If I were making this pike, I would create a *squarish* access space, perhaps a removable trapdoor with scenery on it, in the back taking in the space defined by the words "reverse loop" and "interchange" on the plan. A similar hole, though smaller might well be made about where the words "abandoned traction grade" appear.

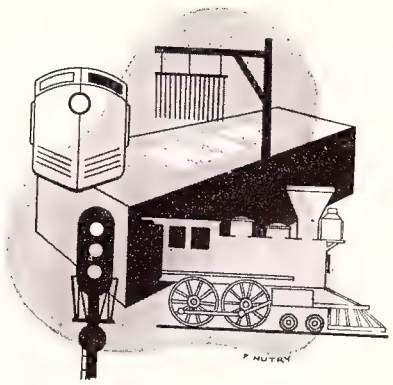
The dashed lines constituting the hidden layover track, part of the main line, and part of the cut-back track would normally indicate that that trackage was in tunnels. But tunnels so long and inaccessible would be an open invitation to trouble, or rather a *closed* invitation. I have utilized the method of having these track behind scenic flats so that they can be reached without underground work, either by the proposed access holes, or by walking along the river *a la Gulliver*. At the extreme left end these scenic flats might depict the city served by Union Depot, then mountainous country, rural scenery behind Valleyton, then more mountainous scenery. The wall could then be decorated to represent distant hills and the sky.

The first track to be built is indicated on the plan by a triple cross-hatched line. This initial trackage will later constitute the hidden layover track, but will provide a place to run trains while construction proceeds on the reverse loop, main line, and cut-back track in the order named. The yards should be built last of all trackage.

The level crossing between the Depot and the River is indicated with both tracks on two foot radius curves, which would have to be made up specially for the site. However, I believe either a sixty-degree or a ninety degree crossing could be used with some chiselling on the radius of the curves involved. If you must buy your switches, I believe #5's (two foot radius) could be used throughout, except at Helper where the three wye switches are just that—wye switches, which are commercially available. Switches at other sites, such as the throat of the passenger storage tracks, appear to be switches on curves but are not: they can be standard switches, but with the "Straight" part

(*Continued on page* 43)





Kit Of The Month

By ROY MILLARD

LAST month, in discussing Gordon Varney's Diesel locomotive kit, we failed to mention one problem that we didn't have in the good old days—befo' de wah. Then, when we built a model we could leave the parts lying all over the house. As a matter of fact, a finished job would be given a place of honor on the mantle until the next reefer rolled off the cellar assembly line.

Not so today! Our own little Cannonball Express had so many trips on the Silver Meteor during the war—aside from the fact that she's at the ultra-inquisitive age—that we've had to provide her with her own model setup. No tracks and no DC, mind you, but a bit of rolling stock enough like Daddy's to make her happy.

The kit we got is the extremely inexpensive StromBecker Rock Island Rocket, which turned out to be the pick of the month for us—and in more ways than one.

This set of models, for that's what it is, complements Varney's Diesel locomotive. It consists of four pieces—a solid dummy power car, to be built up, Bear Lake dinette, Mt. Evans coach and Pike's Peak observation car. The latter three are frame built up. We mocked up the power dummy for the little Cannonball, and built up the three cars as rolling stock for our own powered Diesel.

However, for those who are interested, the dummy locomotive can be fitted up with any of the standard HO power trucks and will react well on any pike. For road operation of the four pieces, some extra material is needed, and is readily available at the nearest hobby shop. This includes a power unit, three pairs of couplers (the kind you usually use), seven trucks (assembled or in kit form—your choice), and three to four ounces of lead weight. The last is to increase the weight of the locomotive to from ten to twelve ounces to increase traction.

So much for the locomotive itself. We didn't power our model, preferring to bribe the Cannonball with it. But we did need, and buy, six trucks and the couplers. When we were through we had three beautiful cars to roll behind Varney's Diesel.

The cars consist of pre-cut roof pieces, ends, bottom and fluted sides (all wood) and printed cardboard window strips and name plates. After all the woodwork is sanded, some adjustment has to be made for HO operation. This consists of trimming out sections of the flange on the fluted sides to allow the HO trucks swivel room.

When this has been completed, the car ends, or filler blocks, are cemented in place on the floor, followed by the roof pieces.

Allowing the woodwork time to get acquainted, we next went to work on the printed cardboard. These pieces come in glistening silver ink, with the windows represented by white squares. You can either leave these pieces as is, or for more realism, carefully cut out the white squares and glue celluloid (not cellophane) strips behind them for realistic windows. For the information of those inquisitive souls who may wonder why the emphasis on celluloid-cellophane reacts to moisture by contracting to such an extent that it will warp your cardboard out of shape. And as an afterthought, it lacks the strength of celluloid.

Back to the woodwork, which should by now be solidly cemented. Trim the raw joints by sanding down, and lay on a filler to seal the grain. Next apply aluminum paint, using several thin coats rather than slopping on one thick one. We gave the underbody a coat of dull black to finish the trim.

The couplers and trucks come next. The position of the coupler will depend on the type you use. However, it is necessary to leave 5/16" room between cars so that they'll operate on a short radius.

Both Bear Lake and Mount Evans cars are built in identical fashion, differing only in printed cardboard detail. The observation car, however, has the typical rounded end of streamliners, and greater care should be taken.

The trucks on these cars will provide enough weight for smooth riding, but if you desire, lead slugs or washers can be glued inside the cars before the sides are set in place.

For added realism, diaphragm ends should be attached to the cars, but we haven't been able to find anything that will work properly. We probably haven't looked long enough.

As we intimated earlier, we originally bought the kit to placate the youngster, then "stole" three-quarters of it for our own use. Admittedly the cars don't have the detail of more expensive kits, but even with the extras we purchased, they don't cost as much either. And they sure look swell highballing behind the Varney Diesel.

TIP OF THE MONTH

Aside from the work he does on your teeth, your dentist is a good man to know! If you know him well enough, you may be able to use his drill (supplying your own bits, of course) to reach a hard-to-get-at trouble spot on that model you're building.

Or, why not get him to save his old bits, burrs and polishers for you. When they are too worn down for his use, they still have hours of time on them for insensitive models.

Unfortunately our dentist won't cooperate! He's a model builder himself.

* * * *

For your convenience, here's the dope on last month's article. In it we reviewed Gordon Varney's General Motor's F-3 Diesel, powered "A" unit and dummy "B".

Built up model of the Strombecker Rock Island Rocket.

ONCE UPON A RAIL

Combination Ice Trolley & Line Car

By JAMES D. HALL

MOST of us remember the Line Cars well enough, and those whose memories go back to the early 1920's will certainly recall the four horse tower wagons, then being replaced by the loudly backfiring "Auto-Cars," the newly liberated "FWD's" and the quiet running "Storage battery wagons." Well, the Ice Trolley requires still a little more reaching back into time; but it's a pleasant recollection, on days like these, if you can remember back to say—1916!

She didn't roll—She lumbered—down the street for a trackside meet with half a dozen wagons: "Purity," "Crystal," "Pompton Lakes," "Rainbow," "Simmonds Ice" and a simple-hearted Joe who just sold "Ice." There was a hollow rumble of a heavy door clattering back on its rails —the smell of saw dust—sunlight on the glistening zinc floor and the musty, welcome blast of winter pouring out into an August afternoon. Mr. Simmonds hawed back on the lines—and swore—and hoped. just hoped, to put the tail gate of his wagon within two feet of the trolley door. Then there was the clang of the apron between car and wagon, and the glassy slither of ice across dripping decks. The green flags hung listless in dead heat and the motorman scowled at his watch. In white overalls and trolleyman's cap, the head-man bawled at the swampers breaking out the ice:

"Say, if Throck wuz t'pull up right now in that Metz runabout—He'd fire all of yez—Cut ol man Simmonds right off the account too—an, HEY! YOU GUYS! WHADDAYA THINK WE'RE RUNNIN' UNDER GREEN FLAGS FUR? C'MON, MAKE TIME!"

Yes Sir! Ice—highballed all the way from Pompton Lakes. Never would there be a truck t'make it so fast, that far, with so much—Never! Small boys and Phineas T. Throckmorton liked to believe it would be that way, but always.

Throckmorton was a great guy, once upon a rail! He turned darn near everything into revenue with his fast electrics: packed the US Mail; hauled papers for the Trib; sold juice to the parks and strung along with the Nickleodeons showing Elmo Lincoln films that hurtled sixteen frames to the second past monstrous, blue electric arcs. There was money in everything, then: Ice in summer, coal in winter, circus runs, broadside advertising and lots of passengers! Throckmorton packed 'em in week days for the downtown rush; hauled 'em week ends to the fun spots, and 'tween times to the clambakes up Singac way. And when John Q. Public couldn't take it any longer, Throck hauled him off to eternal glory in a jet and gilt funeral car!

Coal and Ice were good revenue and the electric lines once held a near monopoly on heavy, fast interurban hauling—pushing the cars for every dime that was in them.

But, the Ice Trolley that I remember, in pristine whiteness, hauled no sooty coal off season. Come the first crisp days, and she'd head for the shops to pick up a working platform, lights, wire spools and lockers, and roll out again a Line Car. She was a sturdy brute and with a mouldboard plow could handle a moderate snowfall too. Versatile was the name for the heavy-duty Interurban of long ago.

I'd like to have an Ice Trolley *right now* to run on three minute headways over O ga. track from house to hammock weighted down with welcome refreshment, wouldn't you? Well, Number 764 of the Denver Intermountain Railway fits the description like a wheel upon a rail. Treat her right and you've got *two* cars—just as Throckmorton did—but with half the bother.

On some layouts we could paint one side white with the old Rainbow Ice legend; and the other side would bear the faded yellow of the D.I.M. Run her west in "summer" — East in "winter" with a five minute layover at the shops between "seasons" to pick up the working platform. By leaving a rectangular opening in the working platform we can also avoid the labor of changing the trolley pole mount when converting from Ice run to Line service.

The deck of this forty-five foot inter-urban is made of quarterply with the trucks set 9" apart on centers. The curved end pieces (fig. 2) are jig-sawed out of soft pine and are screwed to the underside of the deck. After the car has been completed we can build up the half-cones, between bumper and car end, with wood dough. These metal covered gadgets are typical of altered D.I.M. equipment and serve to discourage fender riding.

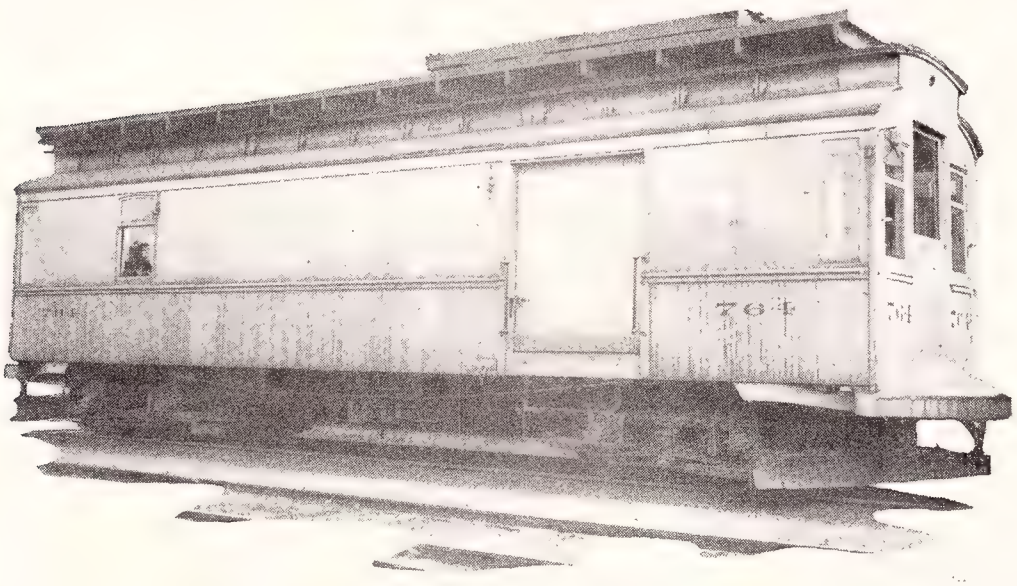
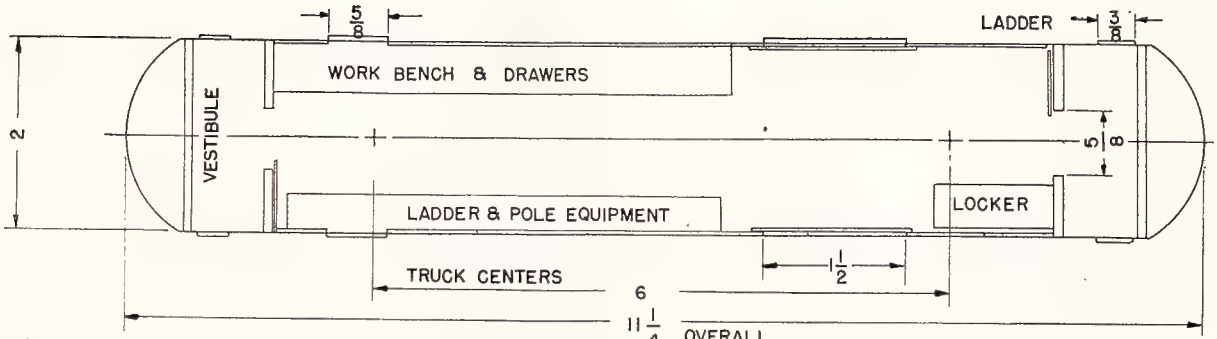


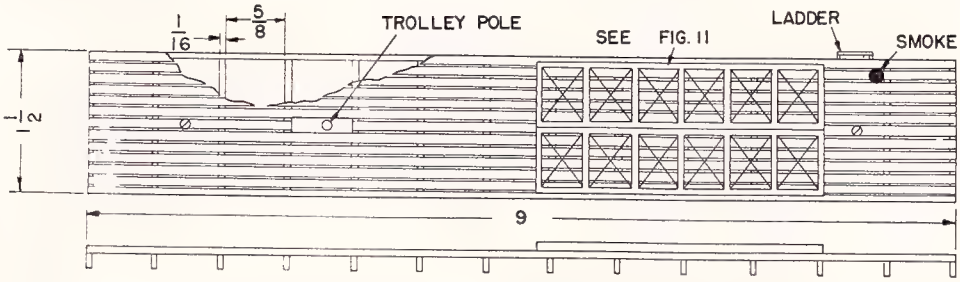
Photo courtesy Terrasilk.

For a strikingly effective all

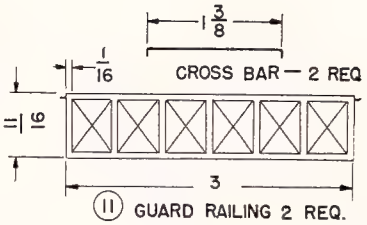


"O" GAUGE — 1/2 SIZE

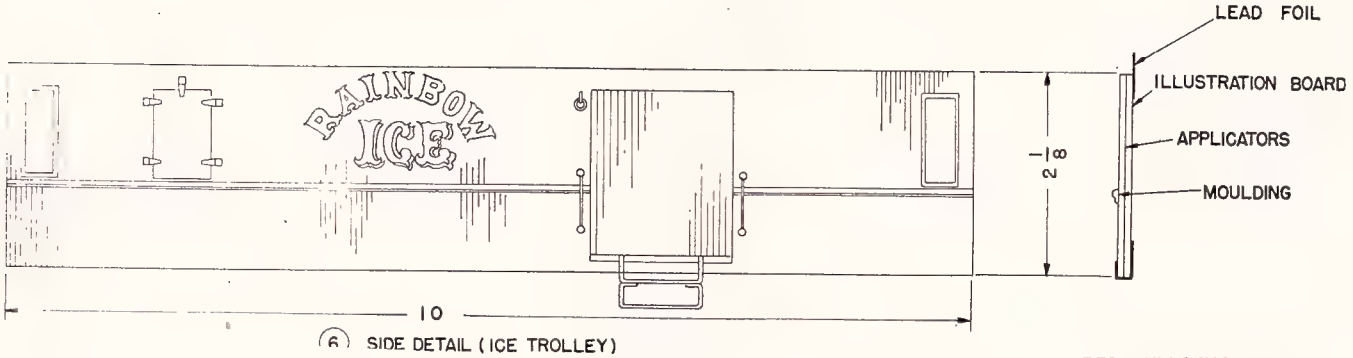
(1) FLOOR PLAN



(10) LINE CAR - WORKING PLATFORM



(11) GUARD RAILING 2 REQ.



(6) SIDE DETAIL (ICE TROLLEY)

wood car, with real character, cut the sides from illustration board as shown in fig. 6, and overlay with hardwood around applicators. (Obtain these at any drug store, specifying "Puritan Hardwood Applicators, round.") They are not slow to place nor will they fall off when the cement has dried out—and here's why: They are held permanently in place with two coatings of orange shellac—one beneath and one on top. They are also secured top and bottom with crimped foil, and are further tied in by the decorative moulding strip at the window line.

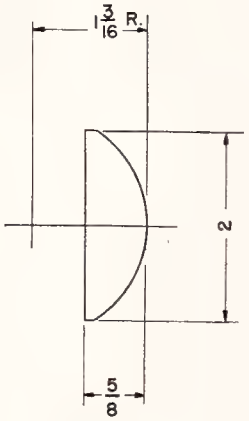
Dip or spray paint the applicators before applying, making them in three shades for each job in this proportion:

130 applicators for each car side:

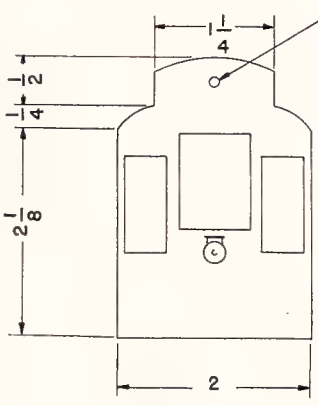
Ice Trolley:		Line Car:	
30	dirty - grey	30	deep - ochre
30	pure white	30	light - yellow
70	off - white	70	medium - yellow

When thoroughly dry mix 'em up (keeping colors but not shades separate) and apply without selecting. You'll be surprised at the natural effect.

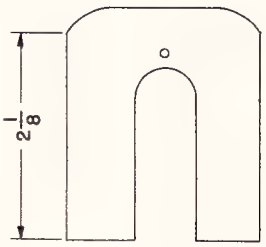
Now coat the rough side of the illustrator's board with shellac and *roll on* the applicators thirteen to the inch, and weight down immediately. This is fast work on the gluing jig shown in fig. 7.



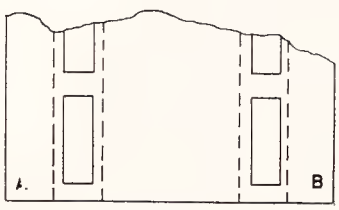
(2) BODY END PIECE - 2 REQ.



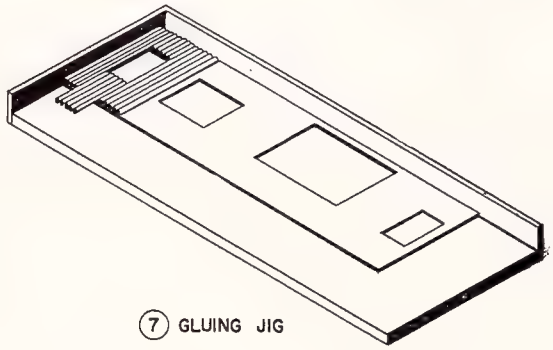
(3) CAR ENDS



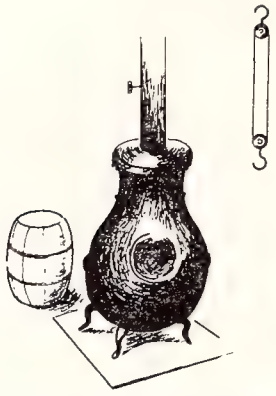
(4) PARTITIONS



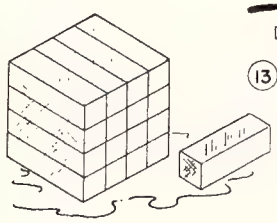
(5) ROOF TEMPLATE 3 3/8 X 10



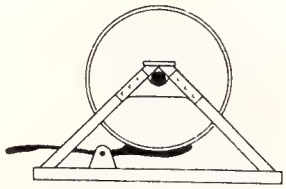
(7) GLUING JIG



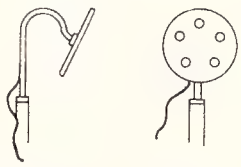
(12) LINE CAR ACCESSORIES (TO SCALE)



(9) ICE CARGO



(13) CABLE REEL $1\frac{1}{2}$ DIA. X $\frac{11}{16}$



(14) WORK LIGHT & PICK-UP

When thoroughly set, cut off the projecting ends with a Handee or a jeweler's saw. Fill in the short spaces over the door and windows and apply decal lettering and the rainbow herald. Shellac again on the top surface, taking pains to see that the spaces between the applicators are not loaded with shellac. When dry, flop the car side over, tint a light green, and coat heavily with some more shellac. To both top and bottom edges, shellac a strip of metal foil (a large size shaving cream tube does it) so that the strips will just barely fit around the car sides to hold the applicators with a $\frac{1}{16}$" bead. (See fig. 8.) When both sides are firmly set, crimp the lead seal with your pliers and apply the moulding strip at the window level using a $\frac{1}{8}$" strip of metal foil and a couple of applicators for the job. This is one overlay job that won't peel off! In erecting the car sides it is a good idea to drill all nail holes and countersink for the brad heads.

The car ends are made of cigar-box lumber and are treated in the same manner as are the sides. Glaze with clear photo film and insert a $\frac{1}{8}$" red glass bead in a $\frac{1}{8}$" hole for a bulls-eye marker lamp (see fig. 3.) This seems to be an especial characteristic of both broad and narrow gauge D.I.M. equipment.

The vestibule partitions (fig. 4) are also made of cigar-box lumber, and instead of glazed passenger car doors, put in heavy solid doors to keep the heat from seeping into the reefer.

The floor of the ice trolley is covered with cigarette tin-foil and is sadly battered with the passage of many tons of ice. For your summer-season cargo, cut a scrap of $\frac{1}{4}$" or $\frac{3}{8}$" lucite to $1\frac{1}{2}$" x $1\frac{1}{2}$". (Fig. 9.) Score to indicate block outlines and cement on a small wedge of wood to hold the "ice" upright. Locate the cargo just behind the door and have a cake or two ready to set off at the next stop. A light above and in back of the ice gives a remarkable illusion of reality.

The roof is formed by use of the template (fig. 5) using light weight, smooth finished illustration board for the job, backing the roof proper, with two layers of heavy cardboard $1\frac{1}{4}$" x 10". Sheath the curves of the roof ("A" & "B" fig. 5) with metallic foil, metal side up. Ink in the clerestory windows, paint and glaze with a narrow strip of clear scotch tape.

The working platform (fig. 10) requires 14 2 x 4's" $1\frac{1}{2}$" long and spaced $\frac{5}{8}$" apart. Dip or spray box car red and lag to two side members $\frac{1}{16}$" x $\frac{1}{8}$" x 9". Make the decking of the smallest "slats" your patience will tolerate, leaving openings for trolley pole and smoke jack. Metal ribbon $\frac{1}{8}$" wide does nicely and will not break in handling as wood or cardboard slats are apt to do. The working platform is held on the roof with two flat-headed $\frac{3}{8}$"-8 screws, to facilitate a quick change.

The guard railing or "Gallery" is hinged with gummed tape and folds flat when not in use. Make the gallery of $\frac{1}{16}$" x $\frac{1}{16}$" x 3" square brass rod, and provide two cross bars $1\frac{3}{8}$" long to hold the guard rails upright when the line crew is working. Leave a couple of nail kegs, block and tackle (see fig. 12) topside and thread a length of trolley wire up to your working crew by way of the side door, to indicate busy days on Throckmorton's ever-expanding empire.

Stocking the line car for maintenance service gives the Detail Hound a wonderful opportunity to do his stuff. If you are one of them, try sculping the pot-bellied stove from balsa, and see how much useful detail you can add to the work bench. The block and tackle are made of yellow carpet thread with two flattened brass beads (snipped from a piece of bead chain) complete with swivel hooks. The cable reel is made from a couple of Washington state tax tokens, mounted on a heavy "A" frame, and is equipped with a foot brake fashioned from a piece of wire solder. For unusual lighting effect, a work-light cable with a $\frac{1}{4}$" tin cone reflector is left on the floor to supplement interior lighting, and to point up detail. A pair of working lights (fig. 14) are mounted on the sides of the car and are adjustable to the job. The staff is of wire solder and the reflector is made of tin. The five seed lamps represent the series-wire tungsten filament lamps of thirty years ago.

Outside details of ladder, plow board, truss rods, wooden pilot (#2 end only), hand rails and resistance grids are added and she's ready to roll.

Suggested colors are as follows: D.I.M. Ry. Body, golden yellow, slate grey roof, maroon working platforms, black lettering. On the Ice Trolley side. paint white with grey roof and black lettering. The legend, "Rainbow Ice" in $\frac{1}{4}$" old style gold letters, against red, blue and yellow.

In ice service, batten the two rear windows with heavy cardboard covers lagged tightly against the window frames with ice-box fittings.

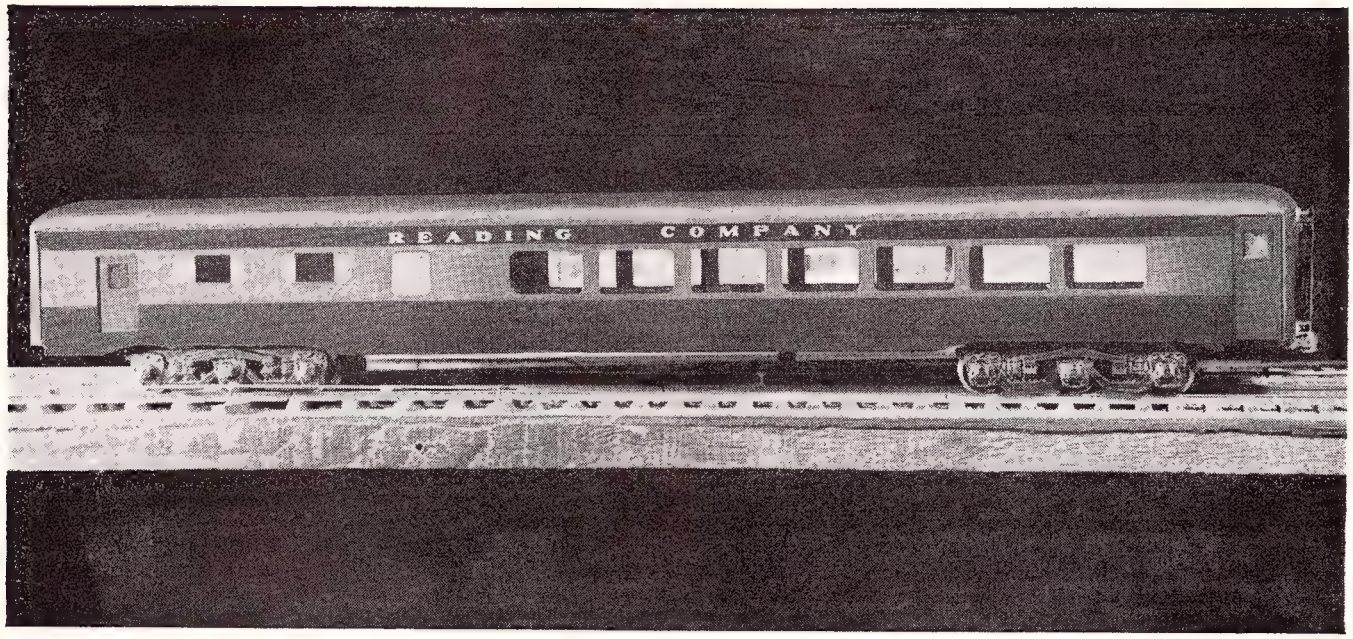
Put a couple of green flags on the head end and send her over the road. Phineas T. Throckmorton doesn't care how many passengers you put into the hole. The standing orders are: "Highball the Ice . . . . It's getting hot!"

Anything goes on a traction line! This dairy special provided deluxe accomdations for prize live stock and exhibitors alike. For this occasion, Indiana's Interstate Public Service used a motor baggage and freight trailer for animals; sleeper and parlor-diner for humans. Photo from the Long Valley Collection.

Bill Schopp is back in model railroading again — "on a small scale," he says, which may possibly mean TT. He attributes the revival to the interest stirred up by writing and later reading his own Memoirs of a Former Model Railroader which ran in the Model Craftsman recently.

Several of his post-revival projects will be described in these pages soon. One, which should have a large audience, is, as Bill describes it, "a piece of HO gauge motive power, complete with motor, for about ten dollars, which should help combat the high cost of model railroading."

Bill is also figuring on a *real* low-cost model railroad to build for himself with ten dollars covering the cost of the first trolley (of course). power source and track!



Streamlined Diner and Coaches

By WARREN B. CRATER

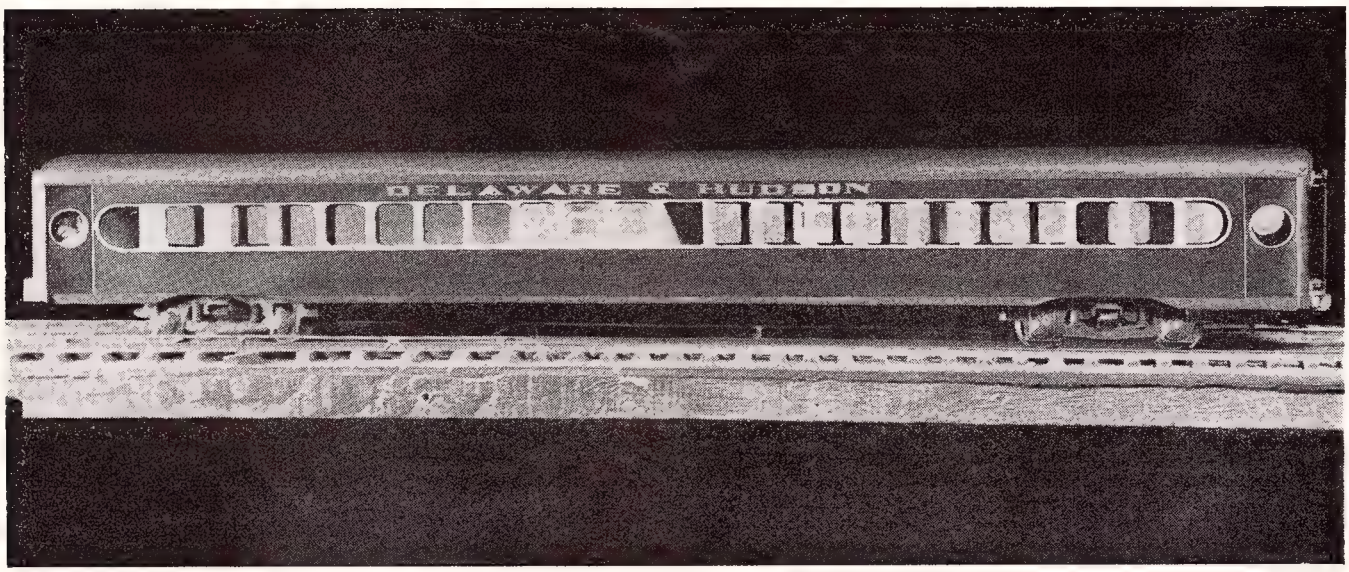
THE diner I have selected for my Streamliner "Mixed Breed" is the Reading Company's number 1187 of the "Wall Street." This is a *rebuild* from a standard Cafe Car and its streamlining consists of the round floor, the apron and the paint job.

Since sealed windows are used with air conditioned cars, the window sash does not show as it did with the old equipment. Therefore, only one thickness of sheet is needed for car sides. This makes less work in modeling, but leads to another source of trouble. When a single layer of cardboard is cemented to the celluloid window strip, drying produces a wharp. This makes additional body bracing necessary. Most streamline cars have larger spacing between which will permit hidden bracing.

The coaches modeled for this "Mixed Breed" are from the Lehigh Valley's "Black Diamond" and the Delaware & Hudson's "Laurentian."

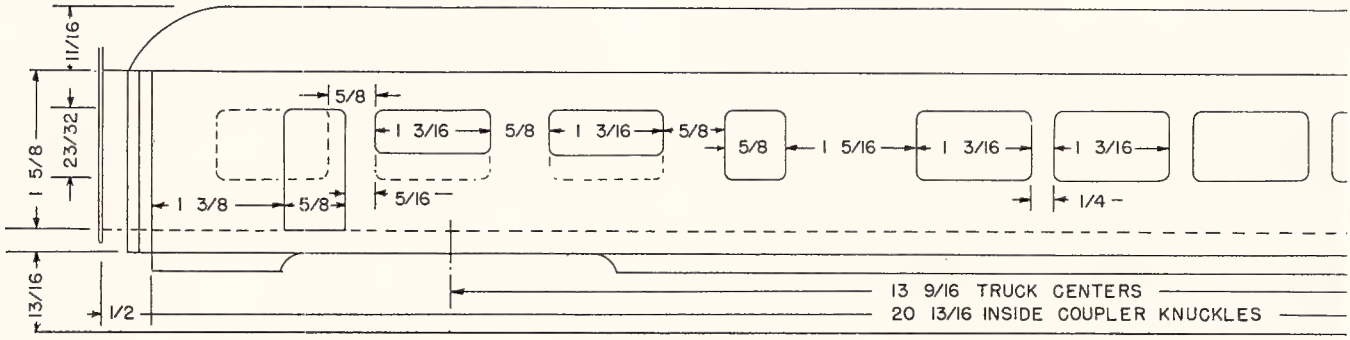
Naturally the accompanying drawings are only for the cars I am building. The general dimensions are almost identical in many of the prototypes. The model builder can change the window spacing to suit a favored prototype with little trouble. The selections I have made (see drawings) include single spaced windows (D & H) and double spaced windows (see L.V.). When a car having large windows is desired, the respacing of the pairs shown in the Lehigh Valley drawing is simple. The overall length, vestibules and car ends are used as is; the windows would then be changed as follows: Make the window length equal to the total of the two small windows and add the center space to the space between the pairs. For "O" gauge, this makes the large window $1\frac{3}{16}$" long and the space $\frac{5}{16}$" instead of two $\frac{13}{32}$" windows with $\frac{1}{8}$" between $\frac{3}{16}$" between pairs. See the accompanying sketches.

Commercial roof section may be used or the roof can be made from any soft wood having a fine straight grain. The floor can

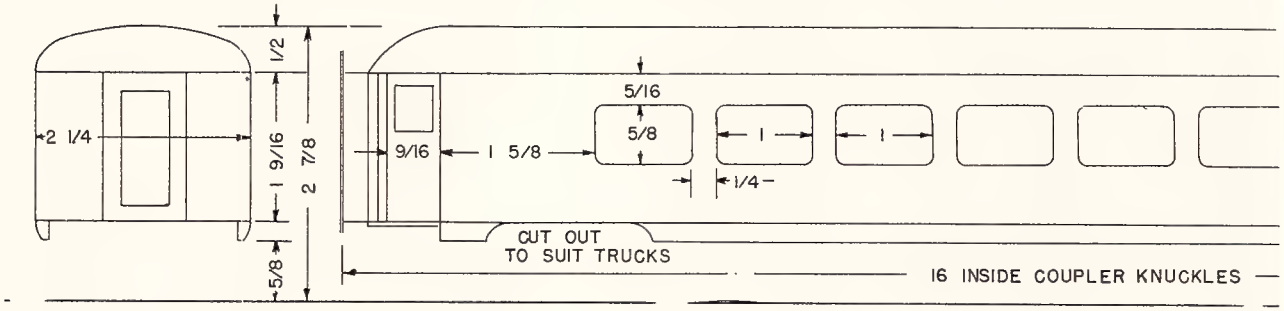


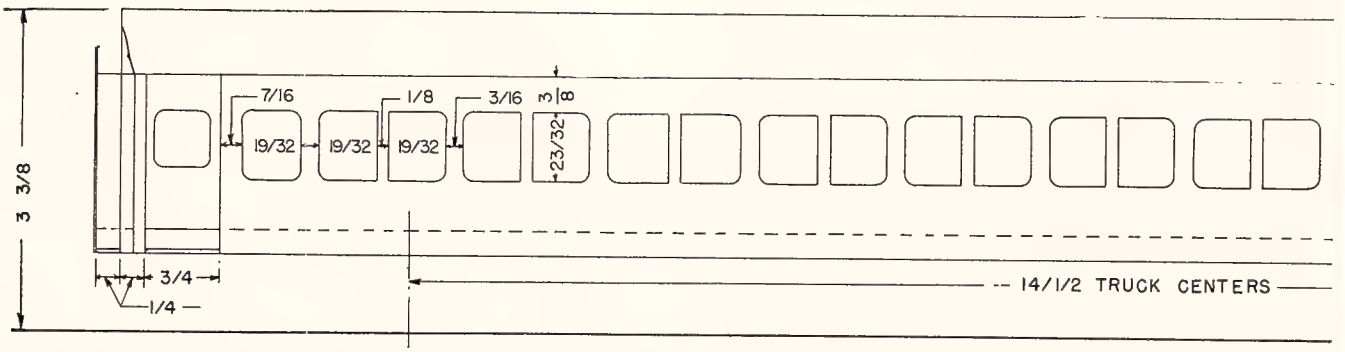
best be made of ¼" plywood, which can also be used for a sub-roof if the roof is to be built up at home. Plain braces of ¼" plywood should be used near the ends of cars at a point between the window in the vestibule door and the first window in the car body. This will square up and space the roof and floor. The end pieces should be made in a long strip and cut with a fine saw as needed. These are to be fastened with brads and cemented to the floor and roof when the standard diaphram is to be employed. When full width diaphram is to be used, a solid end should be installed instead of these separate end pieces. Check with my article in last month's Craftsman for both types.

Several small braces should be used in each side of the car body as permitted by window spacing. These should be cemented into notches in floor and sub roof so as to be flush with edges. These braces are to prevent warping of sides as the cement sets.

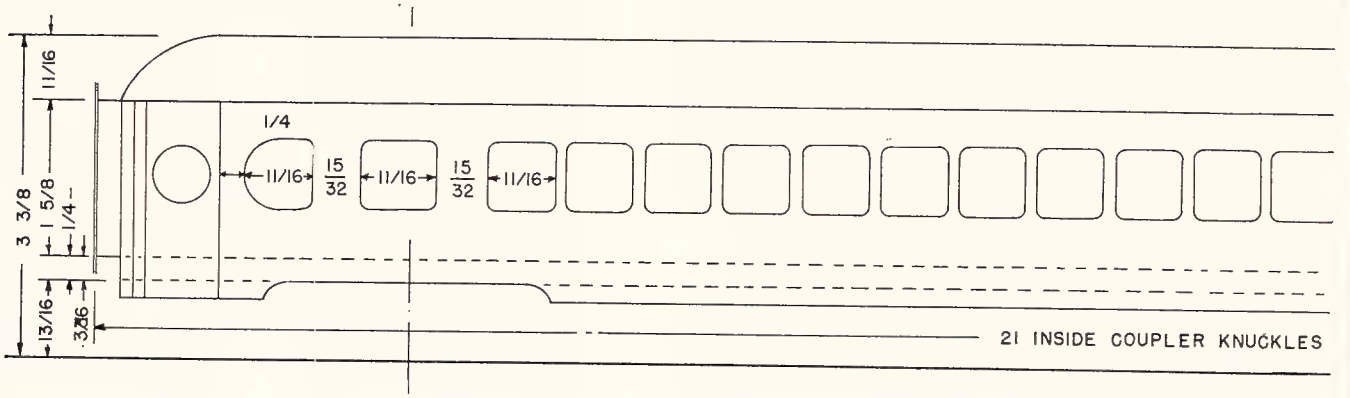


Plans shown in one-half size O gauge. Above the Reading Diner and below the Reading Coach.



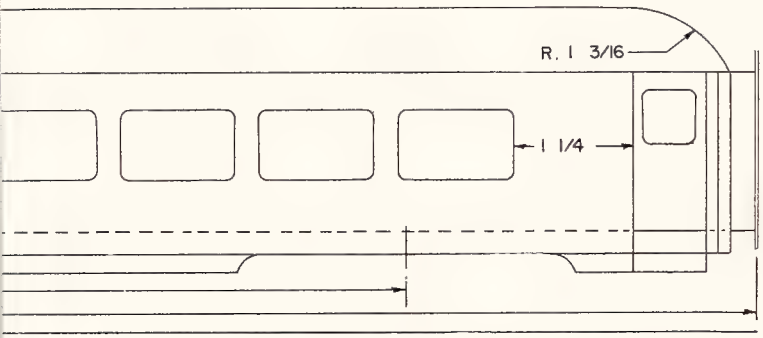


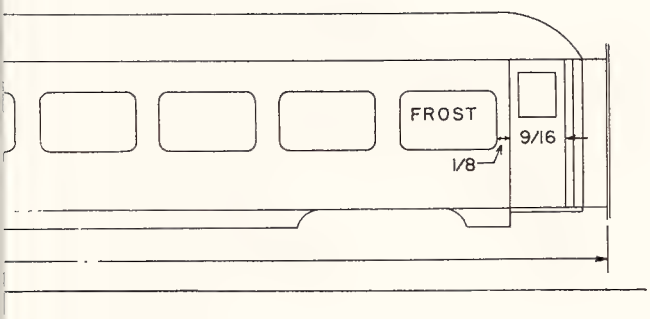
Plans above for the Lehigh Valley Coach, below the Delaware & Hudson shown one-half size O gauge.

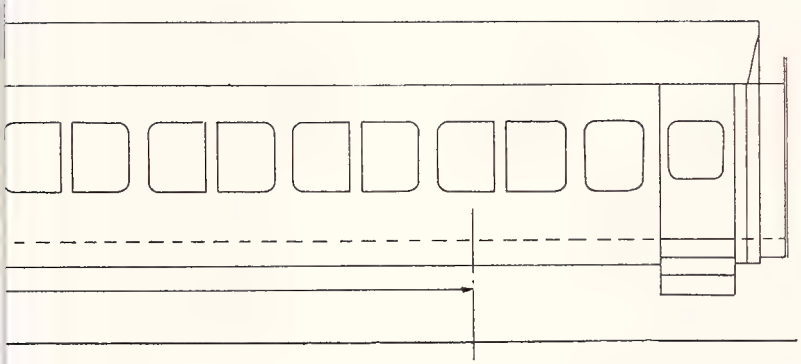


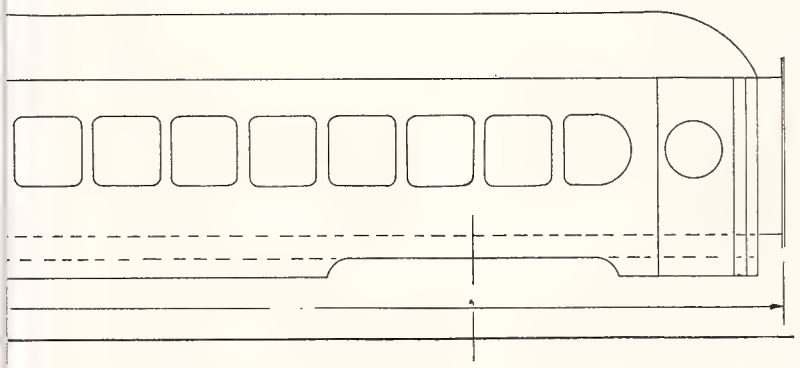
The sides are best made from card board about $\frac{1}{32}$" thick, which is generally available from stationery stores in large sheets. Lay out sides and mark windows etc. Cut the sides using a new razor blade and straight edge. Place the material on a flat board and cut out windows and door openings using wood chisels and gouges. Chisels should be kept sharp and free from nicks to prevent ragged cutting. A set of wood carving tools would be just ideal here.

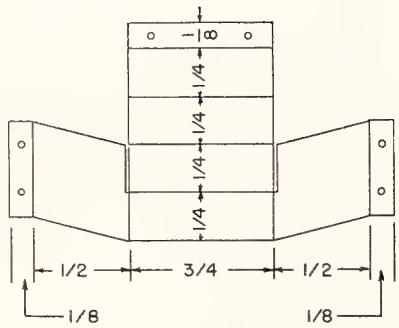
For glazing, use celluloid which is obtainable in sheets or is supplied by Walthers in strips for this purpose. It should be full size of the car side. Cement to body and cement the painted side to dry in one setting. Wait until cement has hardened.











VESTIBULE STEPS
L. V. COACH (MAKE FOUR)

The Lehigh Valley car is red with black trucks, steps and roof. The Delaware & Hudson is coach green (Model Railroad color) with French Grey for the window strip. The Reading Diner is Pullman Green with Coach Green for the window strip.

The apron on the Reading and Delaware & Hudson cars is made of $\frac{1}{8}$" x $\frac{3}{16}$" wood, sanded part round. Cut to clear trucks and then cement and brad in position.

The Lehigh Valley car has no apron and the steps do not fold up. Therefore, it will be necessary to make or purchase the steps.

Use tin plate or thin brass and lay out as shown in the sketch. Cut out and bend first the steps and risers, then the ends. Drill holes in the tabs for those very small escutcheon pins. Solder at back for rigidity and pin to bottom of car floor.

Trucks used on these prototypes are as follows:

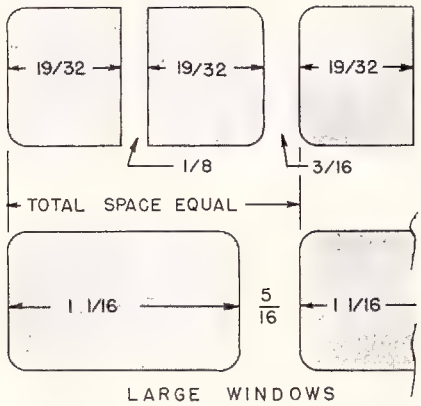
Reading Diner—Standard 6-wheel Pullman

Lehigh Valley Coach—Standard 4-wheel Pullman

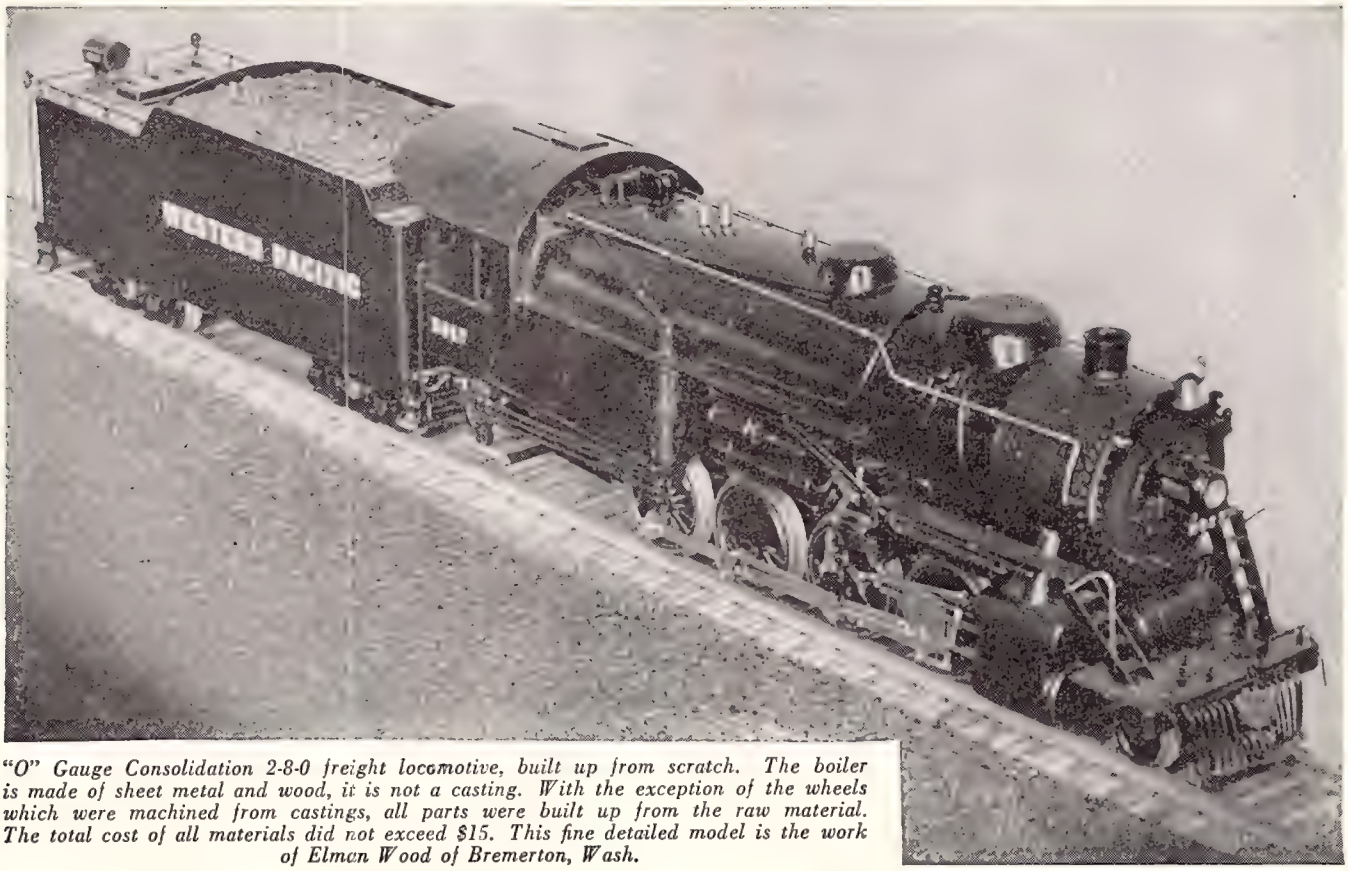
Delaware & Hudson Coach—Streamline Roller Bearing

(*Continued on page* 41)

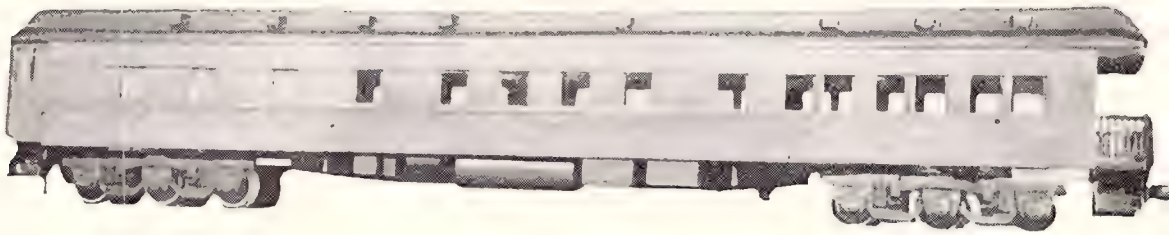
L. V. DOUBLE SPACED



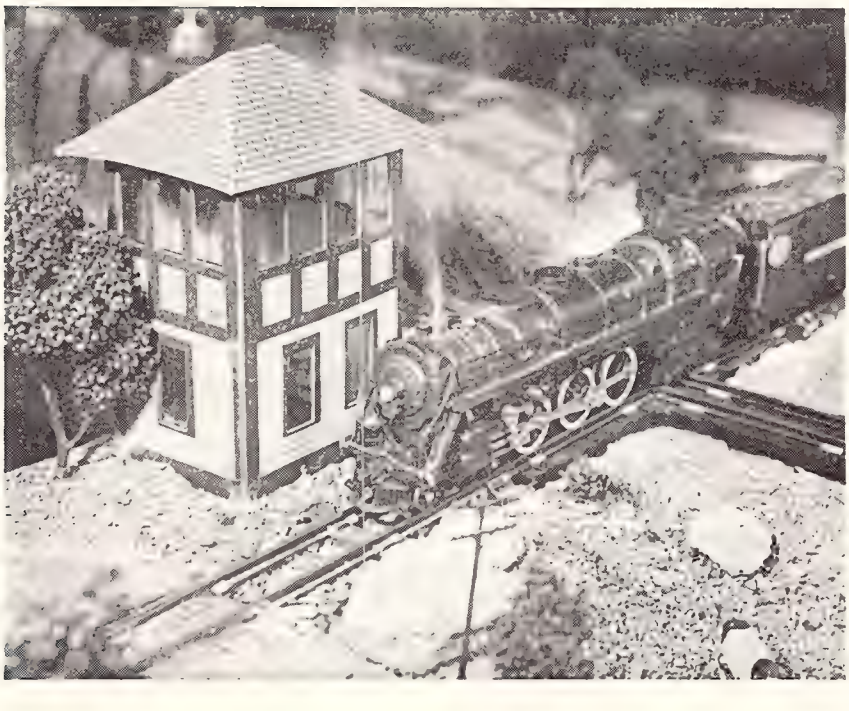
LARGE COACH WINDOWS CONVERTED FROM DRAWING OF DOUBLE SPACED WINDOWS.



"O" Gauge Consolidation 2-8-0 freight locomotive, built up from scratch. The boiler is made of sheet metal and wood, it is not a casting. With the exception of the wheels which were machined from castings, all parts were built up from the raw material. The total cost of all materials did not exceed $15. This fine detailed model is the work of Elman Wood of Bremerton, Wash.

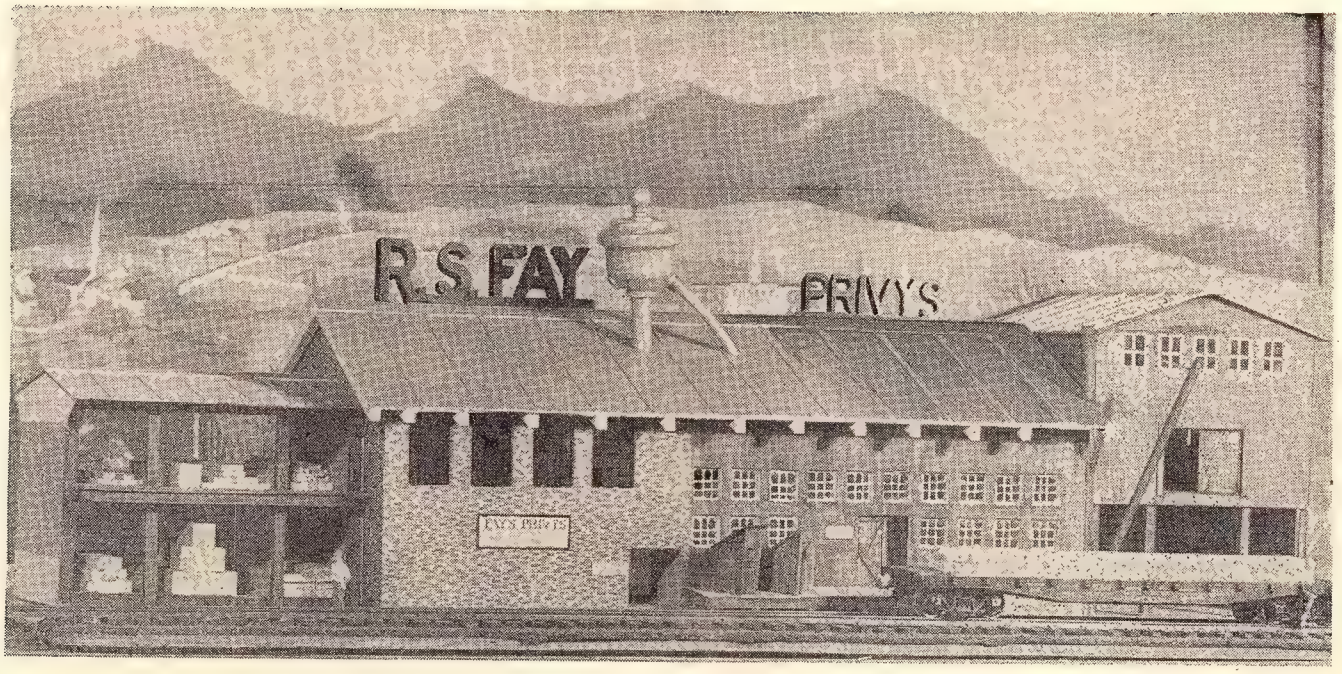


Here is a well detailed O gauge passenger car recently added to the O gauge layout of Lewis Austin of Rockville Center, New York. The only purchased parts are the trucks and couplers.



Heavy freight climbing a one percent grade at Wayne Junction on Robert Green's "S" Gauge layout located in Peekskill, New York. Photo by Martin Kramer.

A motor car in "O" gauge built from Walthers Pennsylvania Passenger Coac kit with major changes throughout. It powered by a K & D #1 motor at a 16 t 1 ratio. This motor car works on eithe two-rail or overhead. The interior is com plete with chairs and lights — all the wor of Les Torrens of London, Ontario.



Fay's Privy Factory, located along the busy lines of the O gauge Aberjona Valley Railroad. This is a very thriving and prosperous industry turning out prefabricated privies as you can see from the samples on the loading platform.

WANT THREE BUCKS

That's what we're paying for both photo and appropriate caption appearing on this page. Two bucks for each photo without caption. Here's a good chance to let your "nabor" see your work and make some easy money in the bargain. Photos are selected on a basis of good photography and reader interest. We do not limit you to some super-detailed model, so don't be bashful—your photo may be the next to appear on this page. Include all pertinent information regarding scale, gauge and all interesting facts. Send material to the Picture Editor, Model Craftsman, Ramsey, N. J. Photos will be returned on request.

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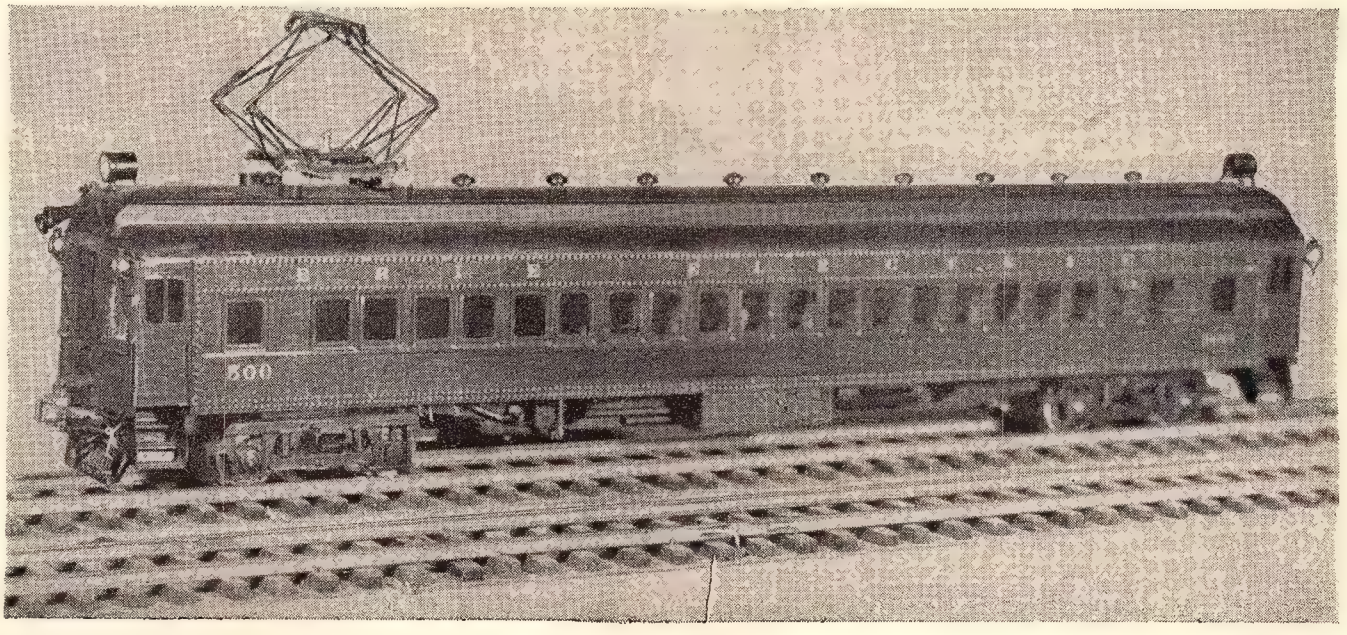

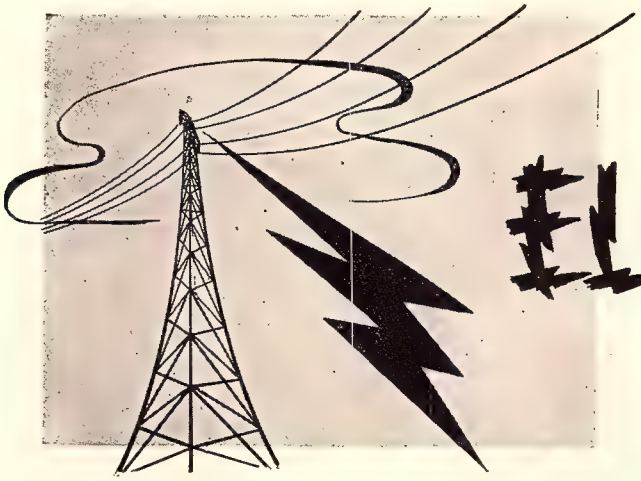

ELECTRICITY

Section VI—TRANSFORMERS

By JOHN T. HALL

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THIS section of Fundamentals of Electricity is concerned with the principles of transformers and includes the construction of a small transformer.

A transformer is a device for transferring electrical energy from one electric to another by electromagnetic means. Transformers can be used to change the value of the current or voltage output. That is, it may be desired to obtain a higher voltage and lower current than is fed into the transformer, or it may be desired to obtain a lower voltage and a higher current.

The transformer is one of the most efficient devices ever made. Practically all of the power put into a transformer is obtained out of it in the form of useful energy.

Transformers, in general, are classified by how they are used. The large transformers used in electric generating stations are called power transformers. Distribution transformers are the ones you see on electric power poles. The wire carrying electricity into a residence usually comes from a distribution transformer.

Potential transformers are small transformers with less than a 500 volt ampere rating. They are used to step down the power obtained from a distribution transformer. Current transformers are small transformers that are rated between 50 and 200 volt amperes.

Transformers are usually divided into two classes, *step up* and *step down*. The *step up* transformer increases the current or voltage fed into it, while the current or voltage output of a *step down* transformer is reduced.

Figure one shows the essential part of a transformer. The side marked H. V. (high voltage) is called the primary, while the side marked L. V. (low voltage) is called the secondary. The metal on which the winding is placed is called the core.

Because we have called the high voltage side the primary does not mean that this is *always* the primary. Common practice says that the side connected to the source is the primary, while the side from which the output is obtained is the secondary.

When an alternating current is applied across the high voltage winding (in our example) there is a field built up surrounding the conductors in the winding. This is in keeping with the principle that a magnetic field always surrounds a conductor carrying a current. Since the current is alternating, the field caused by it will be alternating. The secondary winding is close enough physically to the primary to be in this field. Therefore, the changing value of the field in the primary causes a current to be induced into the secondary. Without going into any more complicated theory, we can write a formula for the relationships between the primary and secondary windings in a transformer. The formula we want is E p over E s equals N p over N s or I p over I s equals N s over N p, where E p is the voltage of the primary, E is the voltage of the secondary, N p is the number of turns in the primary and N is the number of turns in the secondary. The same formula may be rewritten using the current in the primary and secondary in place of the voltages.

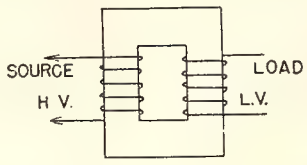


FIG 1

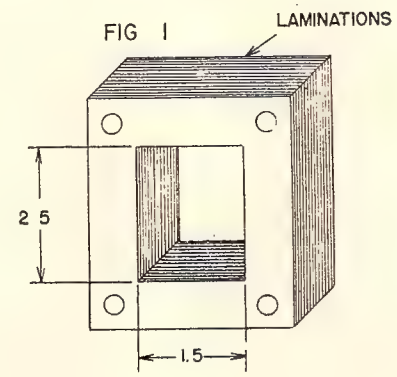


FIG. 2

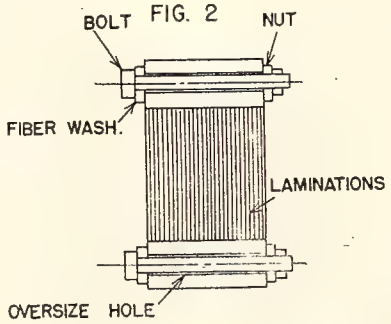


FIG. 3

Suppose we wish to design a small transformer to operate on house current and which will deliver 6 volts with a hundred volt ampere rating. This is a convenient size for use in model railroad work. The formulas necessary for this will be introduced as we go along.

The first formula we need to know is one which will give us the relationship between the voltage, the number of turns and the volt ampere rating. This formula is E over N equals one-fortieth the square root of the ampere turn rating. By using this formula and substituting in the formula, we get E over N equals one-fortieth the square root of 100 or equal to 0.25 volts per turn.

Another formula to consider is A equals 6.45 E over N and from this we find that the area of the core must be 6.45 times .25 or equal to 1.61 square inches. From this then, we find that the width of the core would be the square root of the area or 1.27 inches. This can be called one and a quarter inches.

The number of turns in the 6 volt winding can be found by dividing the number of volts by the number of volts per turn. This gives 6 over .25 or 24 turns. The number of turns for the 110 volt winding is found the same way. The result is 440 turns.

The current in each winding is found by dividing the volt amperes of the winding by the volts of the winding. For the 6 volt winding, this gives 100 over 6 which equals 16.6 amperes and for the 110 volt winding (house supply) we get 100 over 110 which equals .91 amperes.

For the type of transformer under consideration, good design practice calls for about 1000 circular mills of conductor area for each ampere of current carried by the conductor. Using this fact, we can determine the size of wire required for each winding.

Area of the conductor would then be 1000 times 16.6 which equals 16,600 circular mills and also 1000 times .91 which equals 910 circular mills.

From a wire table, all that is necessary now is to pick a wire size with an area close to the one we require. For the 6 volt winding, suppose we choose a wire with enamel and double cotton covered insulation. We could have used other forms of insulation, but since we have plenty of space in this winding, we might as well

choose the best. From a table then the size wire we need for the 6 volt winding is No. 8. This has a diameter of .146 inches.

For the 110 volt winding, we find that a No. 20 wire has the proper area. Since there are a great many turns and space is a factor, suppose we use enamel and single cotton covered wire for this winding. The diameter is .0391 inches.

Since this is a relatively simple transformer, we can wind it on a form such as shown in figure two. The steel for the core should be made of electrical sheet steel, No. 29 gage, (.014 inches thick) having a watt loss per pound of from 0.6 to 0.8. The steel may be purchased from any of several manufacturers of electrical sheet steel, or from transformer repair shops. Steel from a discarded or burned out transformer is excellent for the purpose. The laminations should be clean. but it is not necessary to varnish them.

After the laminations have been cut to the proper shape, it is necessary to fasten them together. This is done by means of insulated bolts as shown in figure three. The holes are drilled large enough so that they offer at least $\frac{1}{16}$ inch clearance around the bolt. The bolt head and nut is insulated by fiber.

Good design practice calls for a window of the dimensions shown in figure two. From these characteristics, we can determine that the length of the window should be 25 times 1.25 which equals 3.1 or for our purposes, three inches.

The next problem is to determine the number of turns per layer of winding. The actual length of the winding space is the length of the window, minus a quarter of an inch, minus twice the keep back. The keep back is the length that the insulation material between layers projects beyond the ends of the winding. In transformers up to 500 volts, this distance is about an eighth of an inch. Carrying this out for our windings, we get 2.5, (3 minus ¼ minus 2 times ⅛ equals 2.5).

To get the number of turns per layer we divide the 2.5 by the diameter of the conductor plus a 10% allowance for any irregularities. For the low voltage winding this would be 2.5 over .161 which equals 15 turns per layer which is wound as two coils of one layer each. One coil will go on each leg of the transformer coil.

For the high voltage winding, we divide the 2.5 by .0391 plus 10%. This comes out as 58 turns per layer. The voltage, 440, divided by the 58 gives us 8 layers of windings. These would be distributed as two coils with four layers of windings in each coil.

The high voltage winding should be wound right over the low voltage winding. The insulation between them (high and low voltage windings) should be of paper or varnished cambric about a sixteenth of an inch thick. Insulation between layers in the same coil should be tough paper about .002 inches thick. The two low voltage windings are connected in series and the two high voltage windings are connected in series.

Total thickness of each coil can then be found by the following calculations:

Core to low voltage equals $\frac{1}{16}$ or .063 inches.

Low Voltage winding equals .161 times 1 or .161 inches.

High to Low Voltage Winding equals $\frac{1}{16}$ or .063 inches.

High Voltage Winding:

4 layers times .043 or .172 inches.

3 layers insulation times .04 or .12 inches, a total of .292 inches.

Therefore the total thickness of each coil is .063 plus .161 plus .063 plus .292, a total of .579 inches.

To find the total width of the window required, we multiply the total thickness obtained in the preceding work by 2, add a quarter of an inch as an allowance. This gives a window width of 1.5 inches.

The average length of a turn, called the mean turn can be found from the following formula:

$$L = 2\pi\left[\frac{W}{2} + (\text{CORE TO L.V. WDG.}) + (\text{L.V. WDG. THICK})\right]$$

$$W = 1.25$$

$$L = 2\pi\left[\frac{1.25}{2} + .063 + .161 + .063 + \frac{.292}{2}\right]$$

$$= 6.64 \text{ INCHES}$$

The total length of the conductor is the mean turn length times the number of turns. For the high voltage winding, this is 6.64 times 440. This 2922 inches or 243 feet does not include leads.

From a wire table, the resistance of No. 20 A. W. G. wire is 12.35 ohms per thousand feet. The resistance of the winding then in 243 times 12.35 divided by 1000 which equals 3 ohms.

The I2R loss is .91 times 3 or 2.48 watts.

The mean turn length of the low voltage winding is:

$$L = 2\pi\left[\frac{W}{2} + (\text{CORE TO L.V. WDG.}) + \frac{1}{2}(\text{L.V. WDG. THICK})\right]$$

$$W = 1.25$$

$$L = 2\pi\left[\frac{1.25}{2} + .063 + \frac{.161}{2}\right]$$

$$= 4.83 \text{ INCHES}$$

The total length of the low voltage winding is 4.83 times 24, which is 116 inches or 9.7 feet. From a wire table we find that the resistance of No. 8 A. W. G. wire is .764 ohms per 1000 feet. The total resistance of the winding then is 9.7 times .764 divided by 1000 or .0074 ohms and I2R loss is 16.6 squared times .0074 which equals 2.04 watts.

This concludes the section on transformers. The next installment deals with rectifiers and instrument multipliers.

A GARRET TYPE LOCO

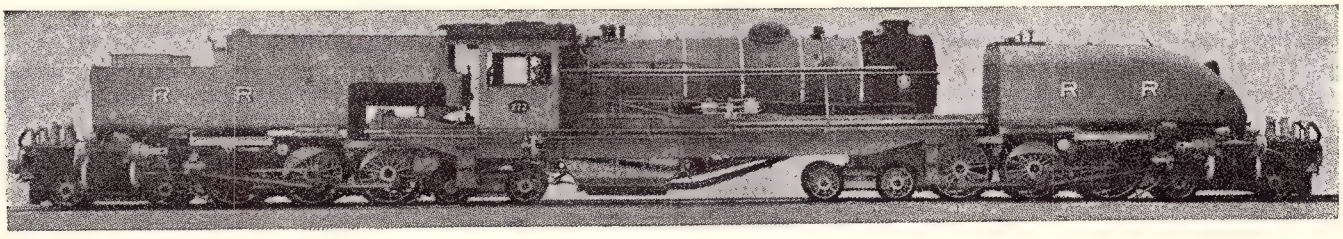
IN the March 1947 Craftsman, there's an article about the C1 Garrett loco built for the Austrailian Commonwealth and put into service in 1943. It will be remembered that the locomotive was streamlined, back and front, but was not too successful.

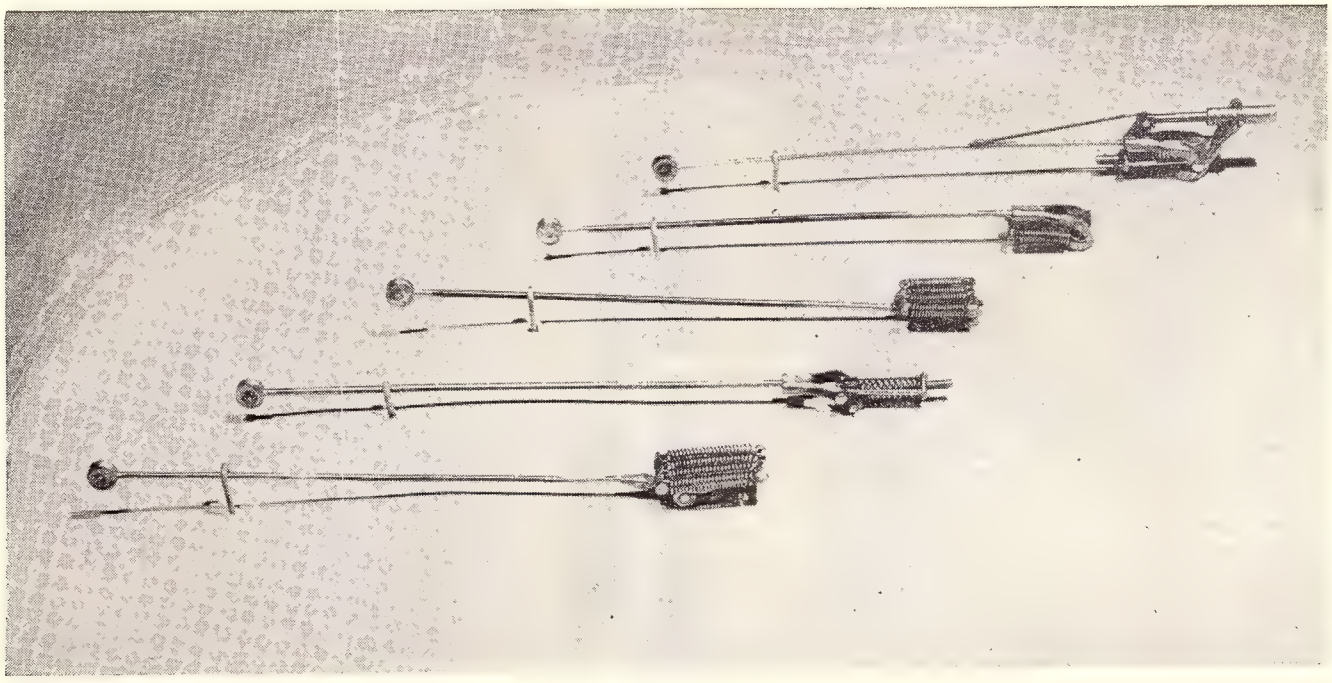
Here in Salisbury, South Africa, we have beautiful streamlined Garrett locos running on 80 pound rail and the gauge is 3 ft. 6 inches. They are rated as 15th class locos designated to operate on 60 pound rail over long distances.

The front tank has been streamlined only, because they haul all trains running front end first. The main specifications are as follows: four cylinders 17½" dia., 26" stroke, coupled wheels 4' 9" dia., total evaporative heating surface is 2,336 sq. ft. and the superheater surface is 494 sq. ft. The weight on the loco in working order is 179.5 tons and the tractive effort is 42,750 lbs, at 85% boiler pressure. The locos pull loads of 1400 tons behind the tender, but were designed for passenger service, a pay load of 500 tons. Unofficially they attain 75 mph with fifteen coaches.

Newer models of this engine are on order from the Beyer, Peacock & Co., Ltd. of Manchester, England, which will have longer and lower front tanks so that the driver has a better view of the road. All the side rods and bearings are needle rollers and are grease lubricated. All the locomotives on the main line of the Rhodesia Railways are being fitted for grease lubrication. All locomotives are fitted with American type automatic couplers and Westinghouse Automatic Vacuum brakes.

The overall length of this *Streamliner* is more than 92 feet and believe me — it presents a very impressive sight on those twisty Rhodesian roads . . . Arthur A. Tibbitts.





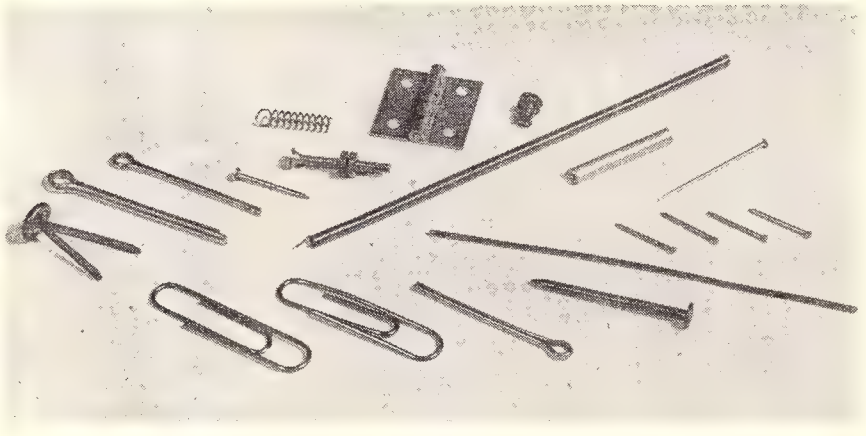
Trolley Pole Bases

FIVE BASIC TYPES EASILY MADE FROM COMMON MATERIALS

By LONG VALLEY ELECTRIC RY.

ABOVE all, the outstanding feature of any traction or street railway car that stamps it as a "trolley" is the pole assembly, particularly the pole base. There is a noticeable difference in appearance between the various bases, so your trolley model can be dressed up considerably by installation of the correct style base as determined by prototype usage. It would seem that few electric railways standardized completely on one specific style of trolley base, the majority made use of several types, generally accepting the bases in vogue at the time their cars were ordered. With the consolidation in later years of many small lines into large traction systems, and the purchase of second hand equipment from bankrupt lines, a great variety of mongrel parts were available in the repair shops to be used up wherever possible. As a result of this, many cars came out of the shops fitted with odds and ends that did not always match. While it was customary practice to install trolley bases of the same type on double end cars, the exceptions to this rule offer modelmakers justification for being a little bit different. Freight and non revenue cars were traditionally the "poor relations" on many lines and consequently were often seen with different pole bases. If you model such equipment, check the prototype as to the bases used.

The five basic poles explained in this article are those most commonly used and range from the venerable compression spring type to the grandaddy of them all, the air retriever base. There were, of course, many other types such as the early



Here are the simple materials used in the fabrication of these beautifully detailed trolley poles.

designs for converted horse cars and the double acting type that rose to vertical position and could be pulled down in either direction rather than be turned around. Additionally, there were variations on the basic styles, but the five selected will amply cover the trolley modelers needs.

The construction methods presented employ common household and shop materials as shown in the photograph and require the use of only hand tools. No precision work is necessary as all the parts are fitted while the work progresses, yet the results are good serviceable poles that have the characteristic appearance of their prototypes. The basic materials for the bases are cotter pins, nuts and bolts that can be either steel or brass, the latter being recommended since it is easy to work and is sparing of pin drills. The poles themselves can be cut from brass, bronze or steel wire, approximating the diameter of a paper clip, but you will find music wire most satisfactory because of its resistance to kinking in service and the fact that a slight degree of arching can be permanently set to resemble the bent poles so often seen in real service. Trolley wheels can be fashioned in many ways, but certainly the most convenient source of ready-made wheels is the contact button found on fluorescent lamp starters. It is only necessary to cut off the buttons and drill the mounting holes. From the standpoint of long life in operation, it is hard to beat wheels cut from hard bronze welding rod.

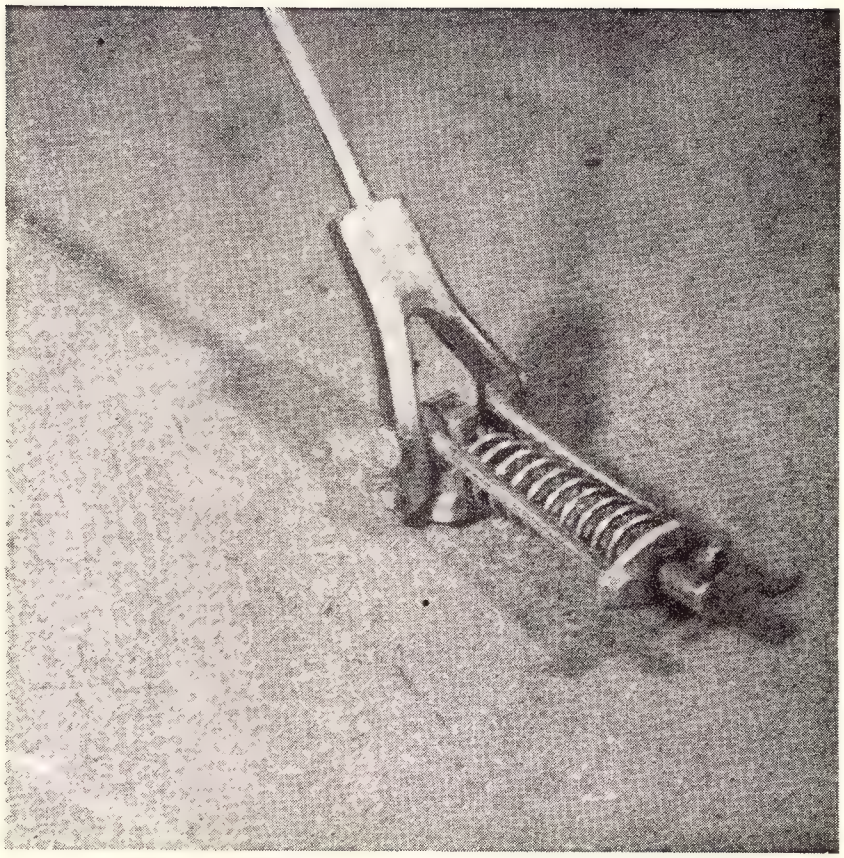
US-11 Base

This turn of the century trolley base is characterized by the extended single compression spring and low profile. In their time these bases were seen in all types of electric traction such as street railways, interurbans and railroad electrifications. They are particularly at home on open bench cars, old convertibles and were even used on Birneys in Philadelphia.

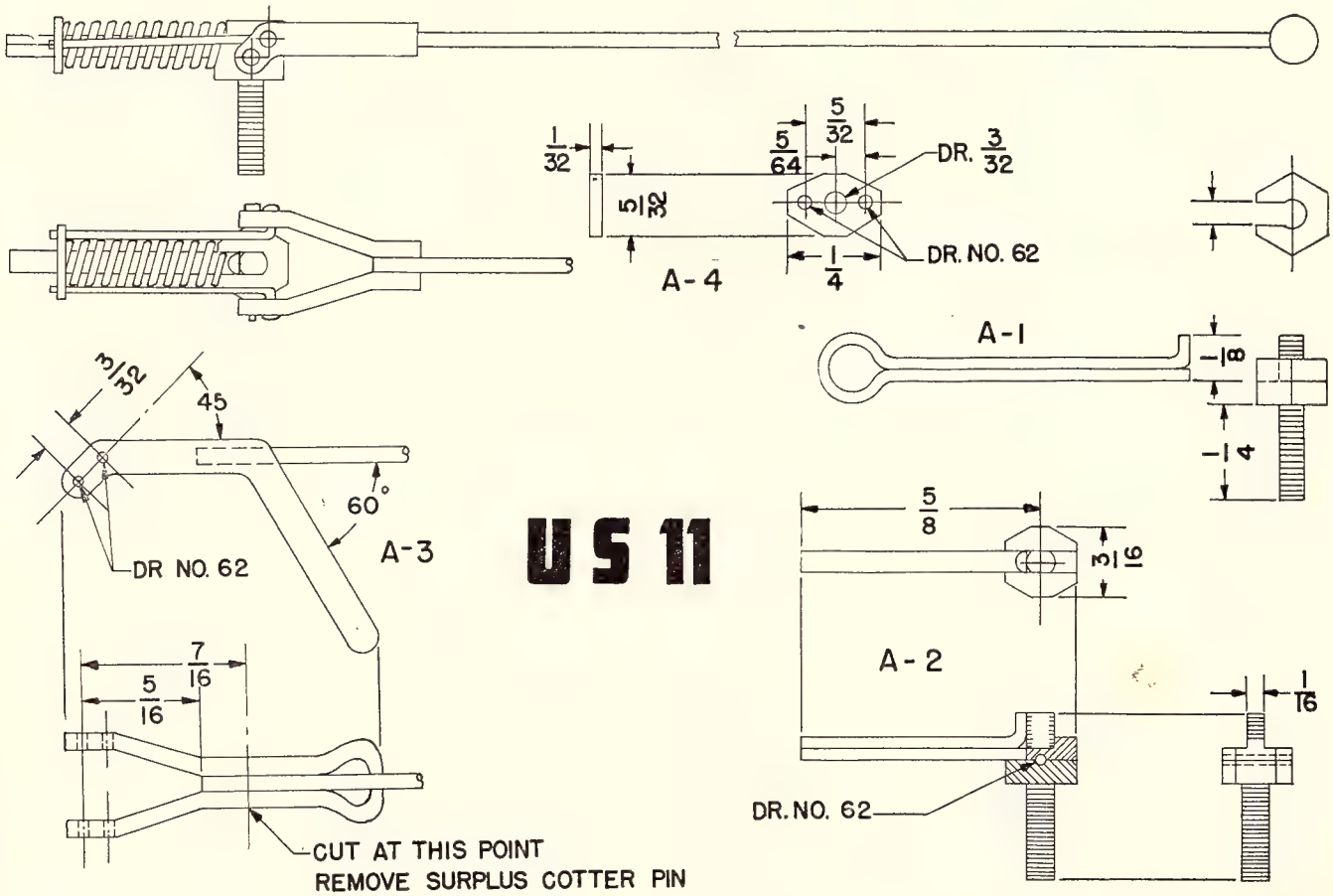
The materials needed for this model are:

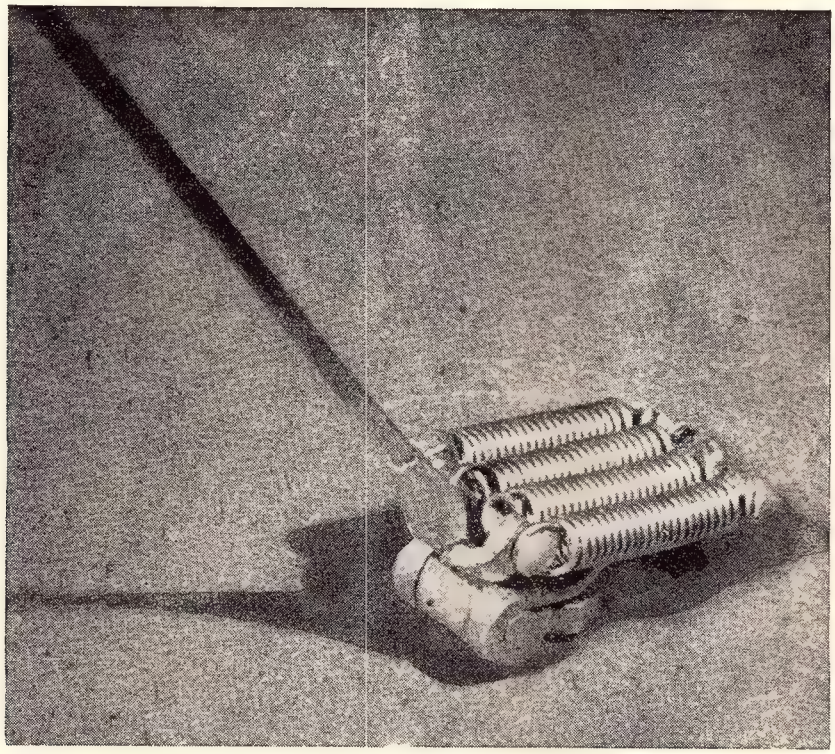
1—cotter pin $\frac{1}{16}$" dia.
1—cotter pin $\frac{3}{32}$" dia.
1—screw 2-56 $\frac{3}{4}$" long
2—nuts 2-56
1—nail No. 20 brad
2—common straight pins
1—piece $\frac{1}{32}$" thick sheet

Construction starts with the assembly shown in Fig. A-1. First cut a $\frac{1}{16}$" wide slot through the flat side of a 2-56 nut, breaking into the tapped hole. Next thread this nut on to the screw and lock it in place with the second nut, leaving $\frac{1}{4}$" of screw projecting beyond the lock nut to act as the base pivot. Now bend the ends of the $\frac{1}{16}$" cotter pin to the shape indicated in Fig. A-1, noting that the lower half is cut off straight while the upper half is bent up sharply. Position the cotter pin in the slotted nut, then solder all parts together as a unit. Cutaway view Fig. A-2 shows the final shape of this assembly. Trim the cotter pin to length, flatten both sides of the nuts to the required $\frac{3}{16}$" width, then drill a No. 62 hole for the hinge pin as indicated. Now, filing in the direction of the cotter pin, cut the upper extension of the screw to $\frac{1}{16}$" width and at the same time file down the thickness of the upper nut to $\frac{1}{32}$" to



The U S 11 Trolley Pole Base in O gauge.





The U S 20 shown above in O gauge

form paths for the spring pull rods. As a final step cut off the surplus screw stock level with the upturned lip of the cotter pin.

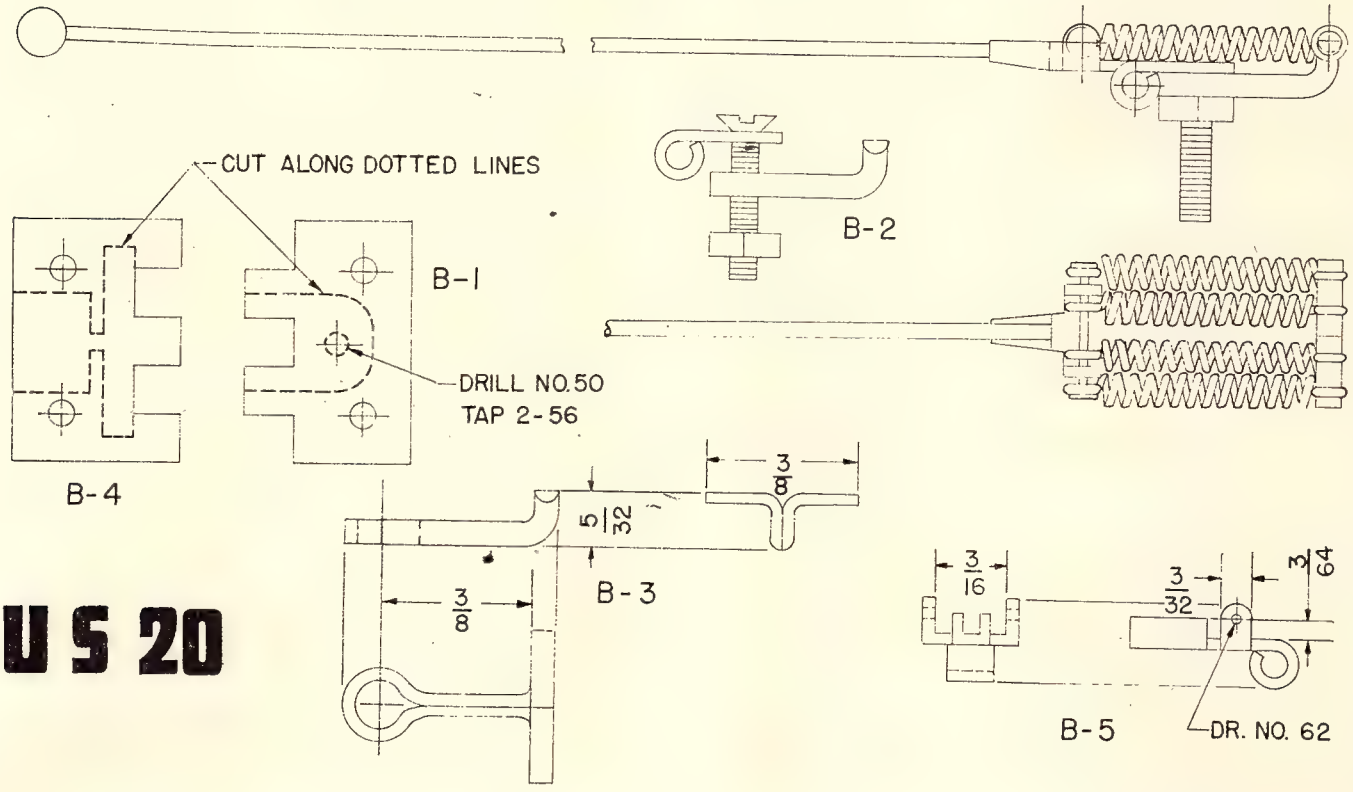
Fig. A-3 shows the pole fork easily fashioned from the $\frac{3}{32}$" cotter pin. Start by making the 45 deg. bend specified, then make another bend near the loop. The latter bend is merely to get the loop out of the way so that the pole can be inserted. Drill the two No. 62 holes shown in Fig. A-3, noting that one is located at the center of the bend while the other is spaced $\frac{3}{32}$" down the fork. Now spread open the cotter pin halves, position and solder the pole in place, after which the fork can be shaped to proper dimensions. Surplus in stock is removed by sawing all around the pole, cutting the loop in half and peeling the unwanted sections away. The fork is assembled to the base by the No. 20 wire brad used as a hinge pin. Snip the brad off closely and lock in place with a drop of solder or by hammering the clipped end into a rivet head. This assembly can be loose since the spring pressure will take up all slack.

Installation of the spring mechanism is the final step. To this end, cut the compression plate from $\frac{1}{32}$" thick sheet to the shape set forth in Fig. A-4. It will be seen from the side and top views of the completed base that the pull rods are straight pins having right angle bends close to the pin heads. Note that the pin heads are on the outside of the fork so that the rods pass inside. This expedient is a departure from real practice that permits a more compact appearance. The spring itself can be wound, compression style, from No. 27 music wire, but it will be found much easier to take a length of ⅛" dia. tension spring and stretch it out to form the desired compression spring. Cut this spring to length $\frac{1}{16}$" shorter than the cotter pin it rides on. With the spring in place install the compression plate and solder fast to the pull rods. Start with sufficient compression to hold the pole in near vertical position. Additional force can be obtained by heating the compression plate and forcing it in against the spring to a greater degree. When the proper setting has been found, snip off the surplus rod ends to complete the base.

US-20 Base

If any one pole base deserved to be called the standard type it seemingly would be the four spring tension style represented by the US-20 units. These bases were in widespread use for many years and to this day seem to predominate. They can be found on all types of cars and locomotives alike, and it is indeed an odd railway that has not used them at some time.

The characteristics of this base are a wide span of springs that seem to lie

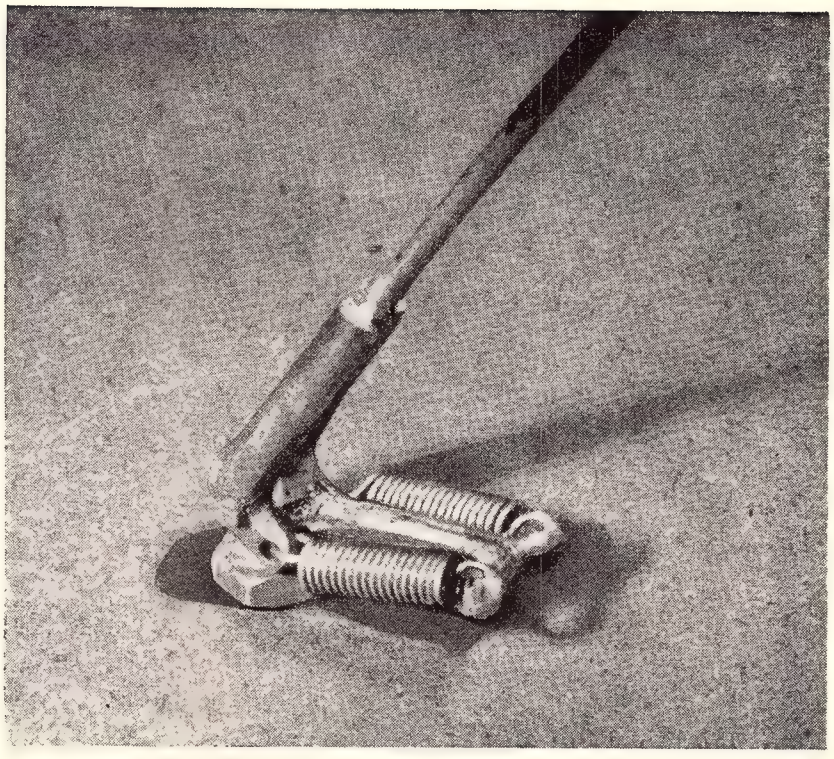


almost in the plane of the pole with the hinge joint carried quite low. To this end, our model is a variation of the time honored hinge and cotter pin construction having the hinge knuckle turned down to produce the low spring effect. Required materials for this base are as follows:

1—small cabinet hinge
1—cotter pin 1/16" dia.
1—screw 2-56 3/4" long
1—unit 2-56
1—common straight pin.

The hinge used on the model photographed measured 3/4" x 3/4" when opened and the center hinge lugs were 1/8" wide, thus when the forked element was cut to the outline shown in Fig. B-1 the width became 1/4". After cutting out both hinge elements, locate the tapped hole in the forked piece so that the cotter pin and nut assembly will be as close to the hinge lug as possible without interference. Now thread the screw in place tightly, then install the straight 1/16" cotter pin, locking it in place with a nut per Fig. B-2. Solder these parts together as a unit, then cut off the screw head flush with the hinge. That portion of the screw extending below the locking nut acts as the base pivot and should be cut to 1/4" length. Now turn up the cotter pin end and flare out to the shape detailed in Fig. B-3 thus finishing this part of the base.

Referring to Fig. B-4, you will note that the remaining hinge element is cut away to form a spring yoke and a pole clamp. Bend the yoke first, noting that it should have the 3/16" width specified in Fig. B-5. Next locate and drill the No. 62 hole in each side, after which the surplus metal can be removed and the tops rounded off with a file. The pole clamp will require some man handling with pliers since it is initially formed to a 1/16" inside width then squeezed tight around the pole. Solder the pole in place, cut off surplus material level with the pole, then file to the tapered outline if desired. At this point, join the two hinge elements with the original pin, properly shortened and soldered fast to one side.



The Stearling Meaker — photo above.

The model illustrated made use of existing brass spring stock of 3/32" outside diameter that is admittedly large. It is suggested that springs can be wound from phosphor bronze wire No. 28 gauge that will present a better appearance. Cut four springs, with loops turned at both ends, to a length that will just hold the pole in vertical position when installed. Reference to the top and side assembly views will show that the spring loops at the lower end slip over the cotter pin ends where they are soldered fast, while the upper loops swivel around a straight pin inserted through the yoke holes. Note that the two outer springs pass outside the yoke as in real practice.

(*Continued on page* 49)

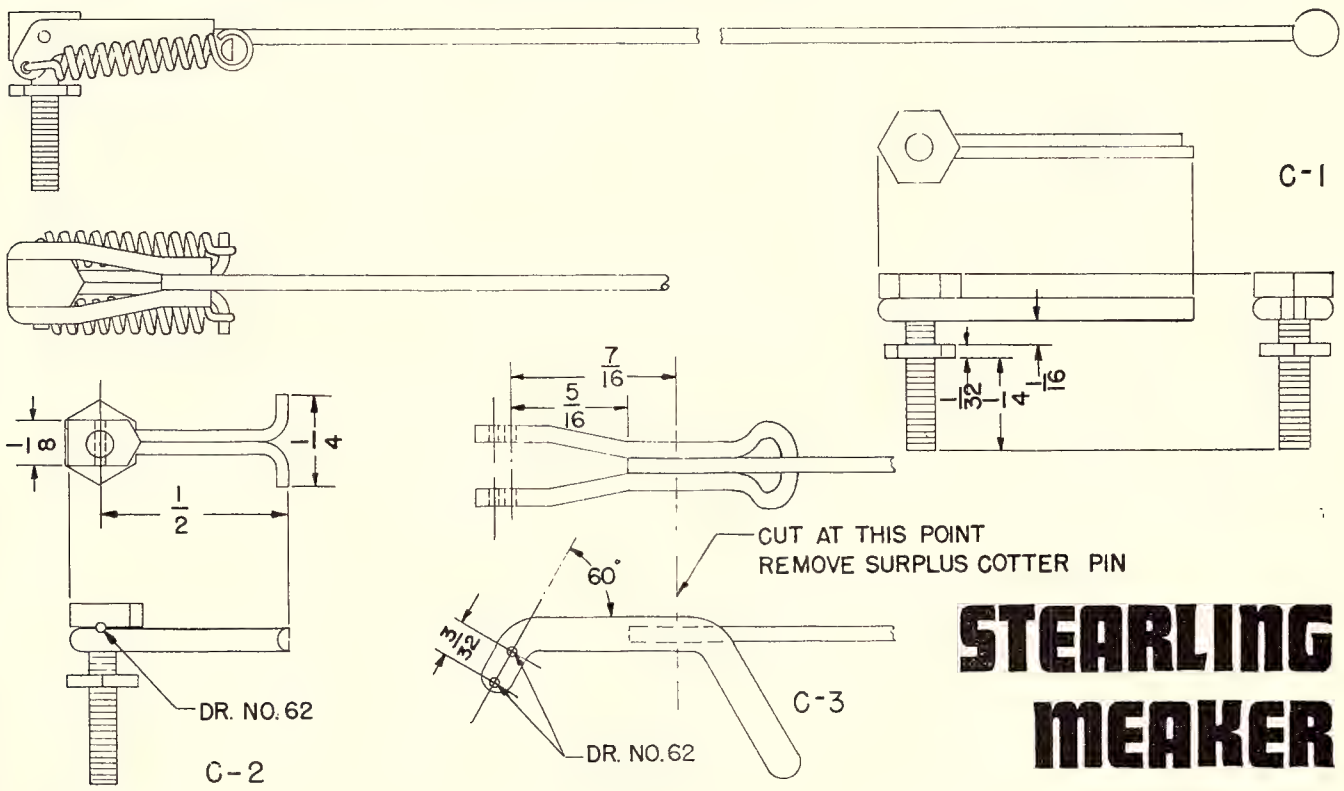
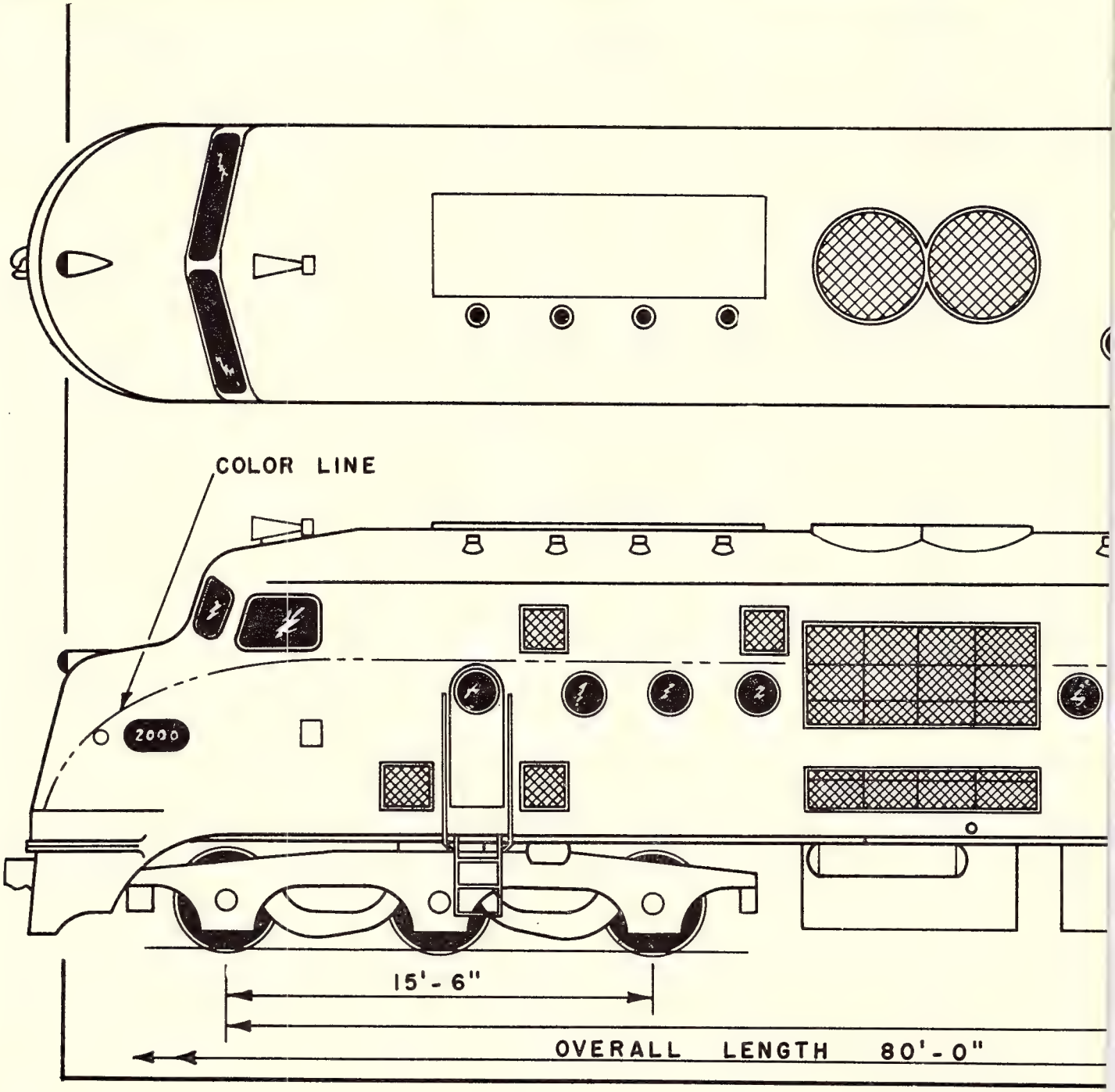


Photo Courtesy Jesey Central



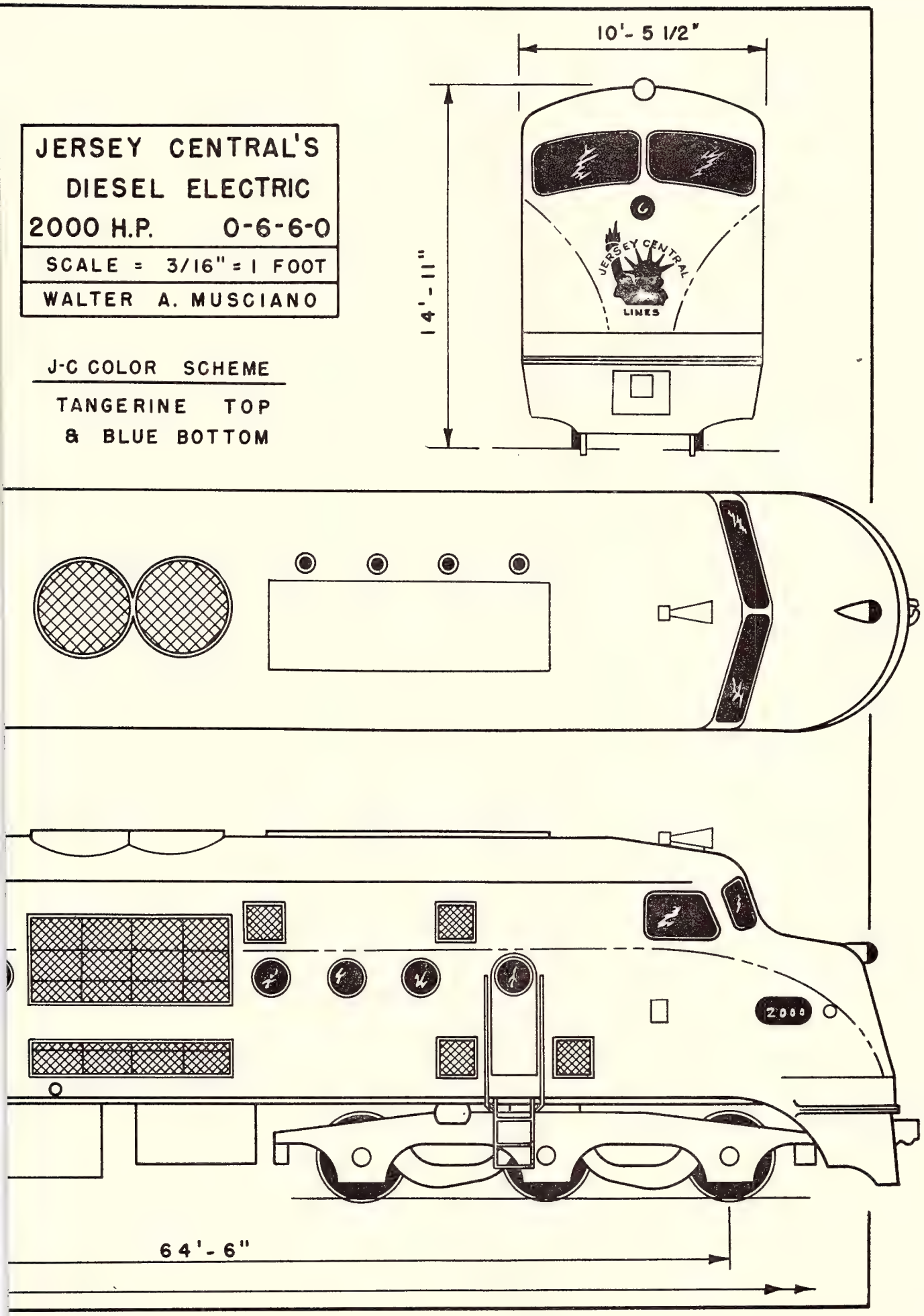
JERSEY CENTRAL'S DIESEL ELECTRIC 2000 H.P. 0-6-6-0

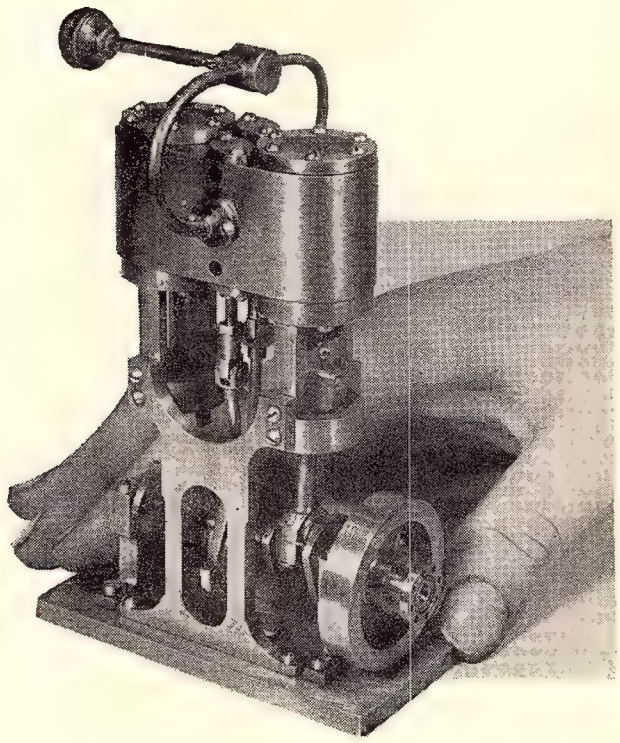
SCALE = 3/16" = 1 FOOT

WALTER A. MUSCIANO

J-C COLOR SCHEME

TANGERINE TOP & BLUE BOTTOM





Vertical Twin-Cylinder Steam Engine

By ALBERT V. LINDSAY

PART II

The first section of this two part article on the construction of a Vertical Twin-Cylinder Steam Engine appeared in the May, 1948 issue.

IF you have had the time and perserverence to complete all the details described on this efficient little half-horsepower Steam Engine, you are now anxiously awaiting the conclusion. We can continue directly with the few remaining parts. All detail numbers correspond with the accompanying sketches, details 1 through 14 were covered in the last issue.

Detail #15 is the eccentric rod joint and can be made very similar to Detail #14 except that it has a slot in which Detail #14 must be a free fit. The eccentric rod, Detail #16, is easily made per the specifications shown on the accompanying drawings.

The eccentric strap (Detail #17) will probably be the most difficult part to make, however if you follow directions it will not be too tough. First take your flat piece of bronze and carefully cut it through, one half inch from one end. Now solder the two pieces together tightly. The next step will be to scribe the outline carefully from the dimensions shown on the drawing, or make a paper template and glue it to the stock. Next drill and ream the $\frac{13}{128}$ inch diameter hole. You can now mill or file the outline and tap drill the holes with a #50 drill, then mill or file $\frac{1}{128}$ inch off one side until the $\frac{1}{8}$ inch dimension is obtained. Try to make the two sides as parallel as possible. You can now melt the solder and separate the two pieces. Next drill the two $\frac{3}{32}$ holes and tap down two #2-56 tapped holes, also the #5-40 hole can be drilled and tapped at this time.

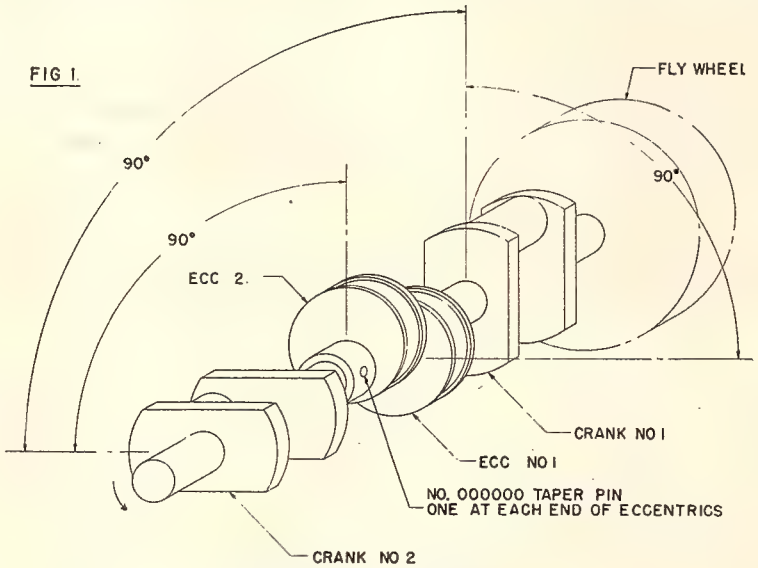
The two side frames, Detail #18, can be made at one time by drilling the $\frac{5}{32}$ screws. The outlines can be scribed or a template made as with detail #17 and the pieces milled or filed to shape.

The main bearing pillow block (Detail #19) and pillow block cap (Detail #20) can be made similar to Detail #17 and Detail #18. If the $\frac{5}{32}$ holes are drilled and the #6-32 tapped holes are put in first, the parts can be held together while the rest of the machining is done.

The main bearings, Detail #21, should be split and soldered together before machining so that they can be fitted to the crankshaft later. The crankshaft (Detail #22) should be very carefully machined making certain that the .3125 diameters are all concentric and in line. If the piece is very carefully center drilled before any other machining is done, the work will turn out much better. The eccentrics (Detail #23) should be machined as carefully as the crankshaft. The eccentric straps can be fitted to the eccentrics at this time.

The connecting rods (Detail #24) and connecting rod bearing caps (Detail #25) should be made following the same general patterns as used in making the other parts. The connecting rod bearings, detail #26, should be made using the same method as the main bearings. The base of the steam engine (Detail #27) should be made just as called for in the detailed drawings. The flywheel (Detail #28) should be made to the specifications shown on the accompanying plans and after machining to size, should be balanced by spot drilling.

So far, we have only considered making the individual parts. Now let us take up their assembly. The first parts to assemble will be the crankshaft details. Figure 1 will give you a very clear picture of the relationship of these parts. The angles shown should be held rather closely. It might be best to insert the short crankshaft (Detail #22) halfway through the eccentrics and drill and taper ream the hole through the eccentric and crankshaft, making sure to hold the 90 degree angle. You can then drive the taper pin. Now insert the short end of the other crankshaft (Detail #22) into the other side of the eccentrics as far as it will go. By turning this



CRANK SHAFT ASSEMBLY

crank until it is 90 degrees to the other crank, the correct relationship of the eccentrics will take place automatically. Now drill and ream and then drive in the taper pin, put on the flywheel and the crankshaft is ready to mount.

The next step is to mount the pillow blocks loosely on the base, insert the lower halves of the main bearings, place the crankshaft in the bearings and mount the upper halves of the bearings with the pillow block caps. Now adjust the pillow blocks on the base until the crankshaft turns freely in the bearings and tighten the pillow blocks to the base. If the crankshaft is too loose in the bearings, remove the caps and lightly file the face of the upper bearing and cap, replace and try the crankshaft again. If, on the other hand the bearings are too tight, you can shim the sides with very thin paper until a free running fit is obtained.

The connecting rods should now be put on the crankshaft and the connecting rod bearings fitted just as the main bearings were. Keep in mind that too tight a fit will cause overheating and loss of power and possibly running the bearing while too loose a fit will cause bearing knocks and may cause the screws to loosen and pull out. After the desired fit is obtained for the connecting rod bearings, the cross heads should be fitted to the connecting rods. Here too the fit should be snug, but not too tight!

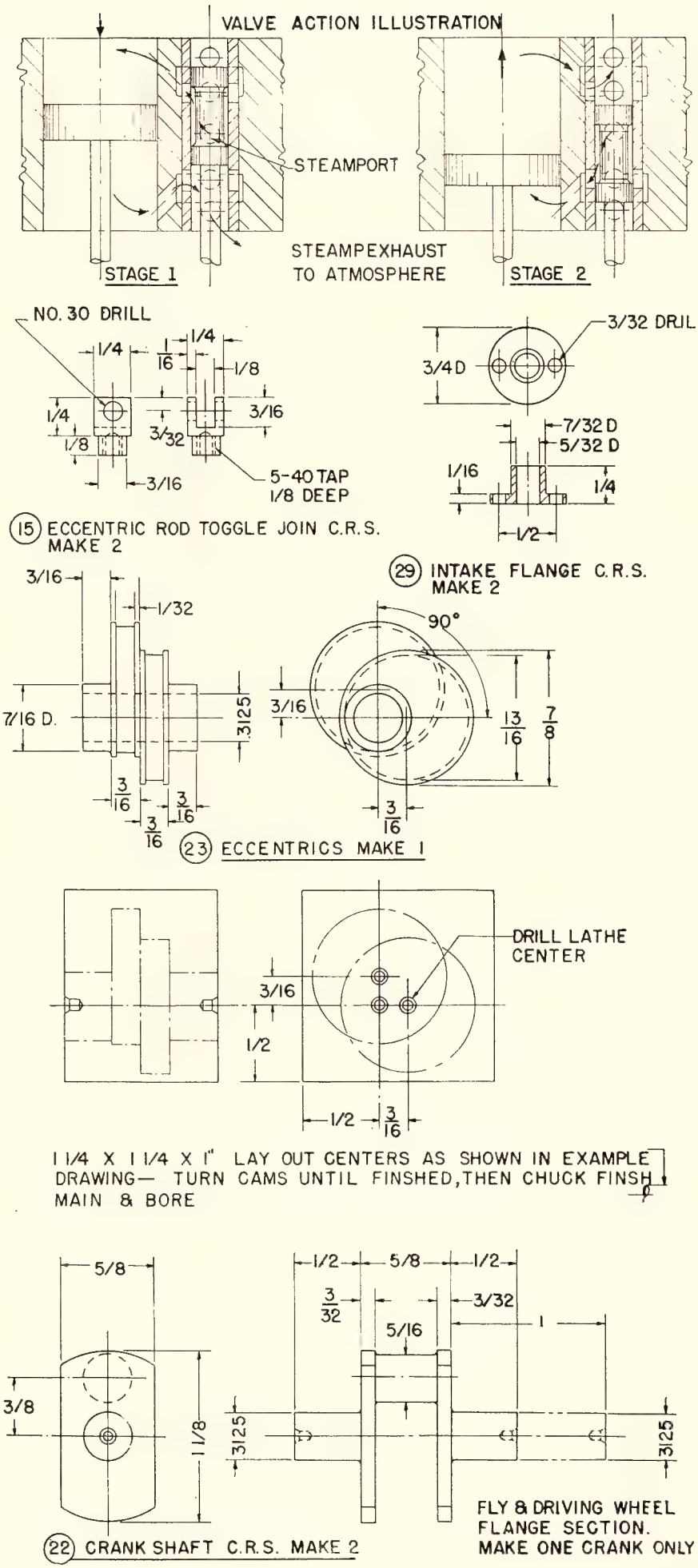
If you have not drilled and tapped the holes in the cylinder block for the cylinder heads, now will be the time to do it. Note that the cross head guides on the lower cylinder heads are perpendicular to the long sides of the block (see assembly drawing of engine). After these holes are located and tapped, the piston rod should be assembled to the piston and then inserted through the lower cylinder head and the packing gland (see assembly). Now assemble the piston rod to the cross head.

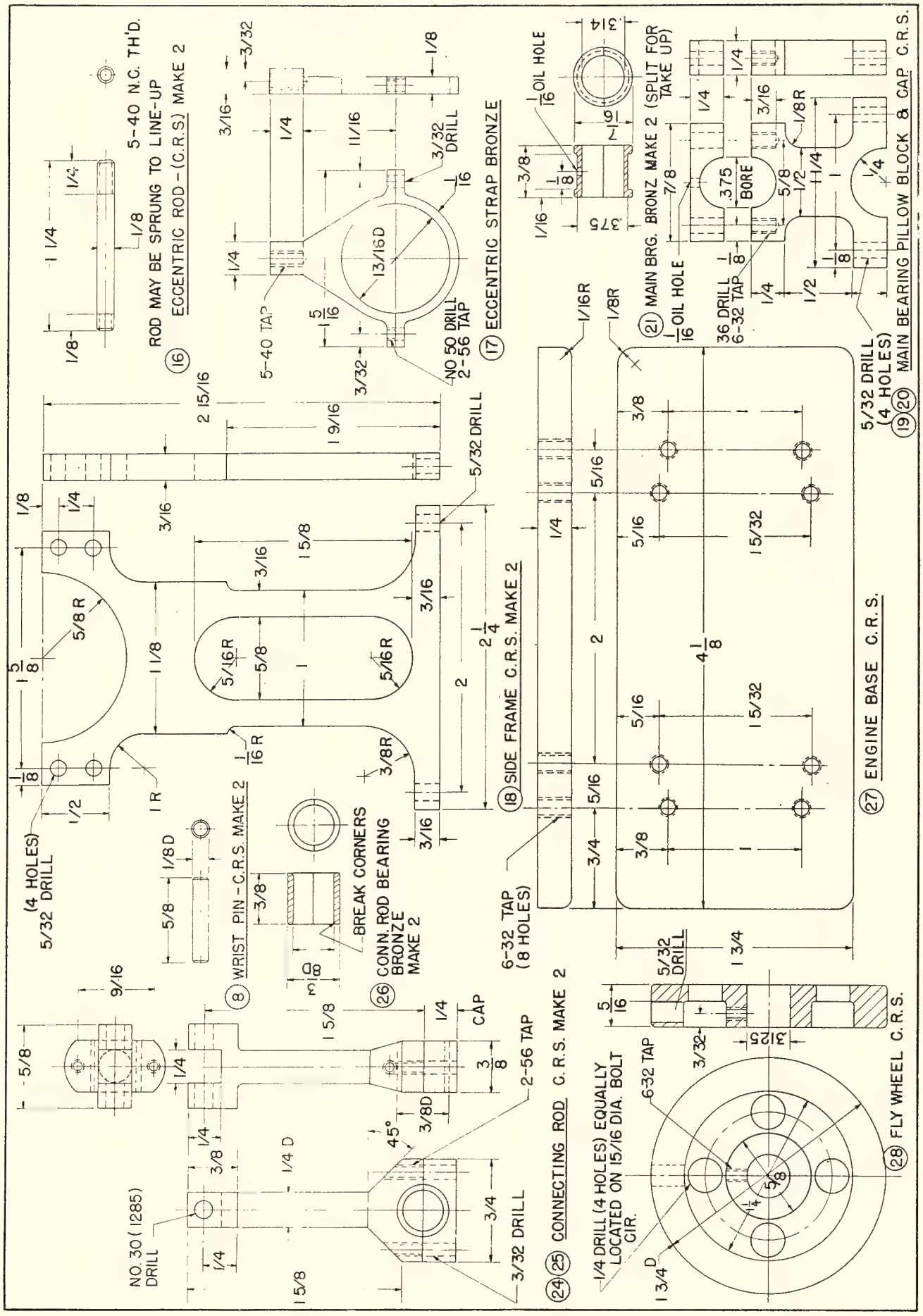
After both piston assemblies are completed, assemble the eccentric straps to the eccentrics, still bearing in mind the necessary fitting, either by removal of metal for too loose a fit or shimming for too tight a fit. The eccentric rod and eccentric rod joint should be assembled next.

The piston valve stem should be inserted through the lower steam chest head and the #5-40 hexagon nut and valve stem joint assembled. You can now press in the joint pin and all the reciprocating parts are ready to be assembled to the cylinder block.

First place the ends of the piston valves into their respective steam chests, then the pistons into the cylinders, put in the lower cylinder head and lower steam chest head screws and tighten. Next fasten the side frames loosely to the block and base. Try spinning the crankshaft, it should turn without forcing. If it should be a little stiff after the screws are tightened in the side frames, it will soon loosen up when running, however, the crankshaft should turn without binding at any point. If it should bind, you will have to investigate to find the cause, perhaps something is out

(*Text Continued on page* 43)




(16) ECCENTRIC ROD – (C.R.S.) MAKE 2
ROD MAY BE SPRUNG TO LINE-UP
5-40 N.C. TH'D.
(17) ECCENTRIC STRAP BRONZE
(8) WRIST PIN – C.R.S. MAKE 2
(26) CONN. ROD BEARING BRONZE MAKE 2
BREAK CORNERS
(24)(25) CONNECTING ROD C.R.S. MAKE 2
(18) SIDE FRAME C.R.S. MAKE 2
(27) ENGINE BASE C.R.S.
(21) MAIN BRG. BRONZ MAKE 2 (SPLIT FOR TAKE UP)
(19)(20) MAIN BEARING PILLOW BLOCK & CAP C.R.S.
(28) FLY WHEEL C.R.S.
(4 HOLES) 5/32 DRILL
NO. 30 (.1285) DRILL
1/4 DRILL (4 HOLES) EQUALLY LOCATED ON 15/16 DIA. BOLT CIR.
5/32 DRILL (4 HOLES)
6-32 TAP (8 HOLES)
NO 50 DRILL 2-56 TAP
5-40 TAP
36 DRILL 6-32 TAP
OIL HOLE
BORE
CAP
45°

Looking Into the Future

With the B & O

By LARRY SAGLE

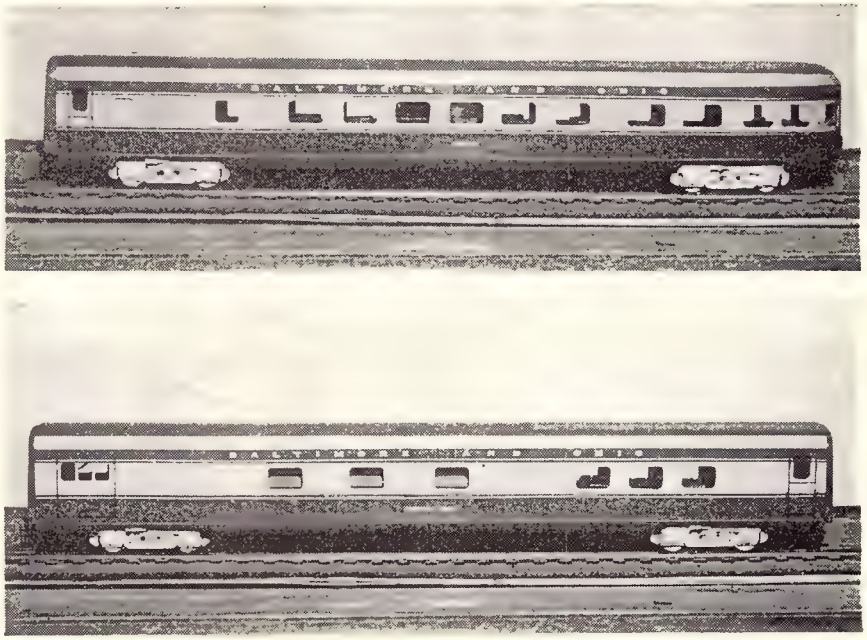
Want accurate information on the F-3 Electro-Motive Diesel locomotive? The Baltimore and Ohio Railroad Company has gotten up a set of drawings which will be furnished to model builders upon request. One side of the sheet gives full instructions for painting striping and lettering of the B & O units. Another super-service by the B & O!

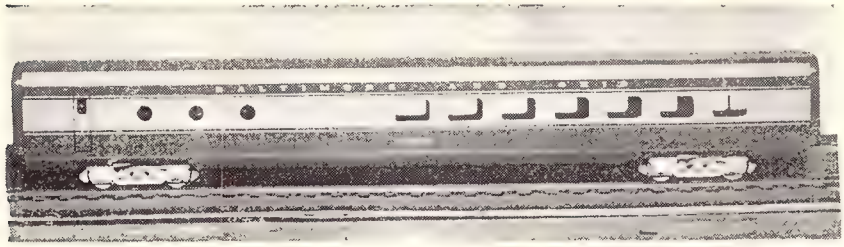
NOWADAYS its common place to see a highly detailed model, an exact replica, of a freight or passenger car, or, for that matter, an entire train. But, its news when that model appears before the public ahead of the prototype.

This was recently the case with the B & O. This modern railroad plans to put a new daylight, all-coach, deluxe train into service between Washington and Chicago. The train has been on order for more than two years and should have been delivered a year ago. Due to shortages and what not, it appears now that it will not be delivered until late fall.

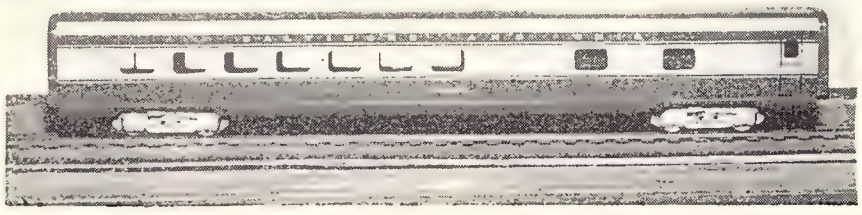
In the meantime, however, George Nixon, well known in the model building field, had been commissioned to build the B & O a model of this train. With the exception of venetian blinds, the miniature train has been completed and delivered.

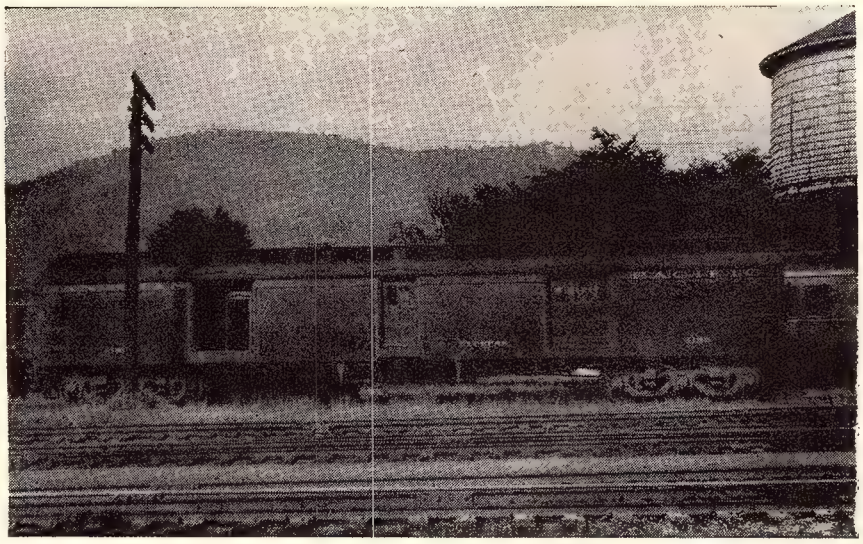
The cars were all made from aluminum extrusions furnished by Kaisner and the trucks are from the shops of George Hines. The dome on the astra-dome car is not a plastic type such as they furnish in the kit now on the market, but is solidly built up with HO rail used as the framing — and real glass. In other words, you will be able to touch the dome without fear of either knocking it loose or putting a dent in it. The models in O gauge are exact duplicates of each of the eight cars which will make up the consist of the two eight car trains.





O gauge models of the deluxe B & O coach train built by George Nixon.





Canadian passenger and head end equipment is a common sight on New England lines and all fans living along the border would do well to have a few pieces of Canadian equipment on their lines.

Photo by Hal Carstens.

CP 3 Door Baggage Car

By HAROLD H. CARSTENS

THE travel urge gets into me every so often and when it does, I have to get out and go—and not by jitney either. Therefore, when Casey Gilbert told me that he and Stan Bradley, president of the Bergen Central Model Railroad Club were going up through New England for a three-day trip, I was most anxious to go along. Casey made up several prospective routes and took these to the New York Central's passenger agent in New York City. Here he was informed that he could not get a rate differential on this route as was hoped, but a round trip rate could be had which represented a substantial saving. Before making a trip, all railfans should investigate the possibilities of getting the *mostest* milage for the *littlest*.

Basically, our trip was to start at Grand Central Station in New York City. Here we were to take the Laurentian which leaves in the early morning and take it to Montreal, P.Q. where we were to stay overnight. Then, the return trip would be made via the CP, B & M. CV and the New Haven railroads.

The great day arrived, Tom Gilbert and I were there early, but as the train approached, it looked as though Stan Bradley was going to be AWOL. We waited at the gate until the very last minute and then made our way to the car. Casey lives only a few blocks from Stan and gets on the bus before Stan would. As the bus went shooting by Stan's block, Casey could see Stan running up, but as is typical of buses in general and especially those of North Jersey, it wouldn't stop. So when Stan missed the train at Grand Central, he hot footed it up to 125th Street Station and finally boarded our deluxe special! Better late than never.

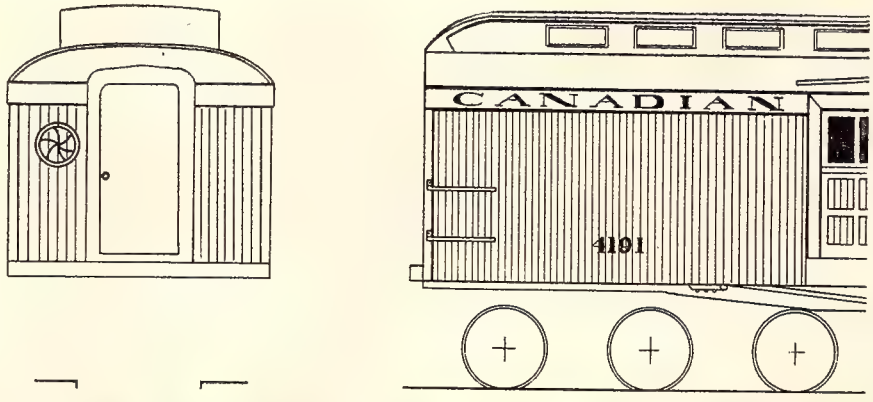
The New York Central crew on the Laurentian as far as Troy were very friendly and showed that the New York Central courtesy isn't just something put on paper. With the exception of one railroad, the same was true of every line that we hit, especially the Boston & Maine. No doubt when competition gets a bit tougher, the Delaware & Hudson may realize the value of having courteous and friendly employees.

We arrived in Montreal at the reknowned Windsor Station. A free cab took us to a boarding house, after which we wanted to look up the Montreal Model Club. We finally found their quarters, but at the time, no one was there so we took in one of Montreal's famous open sightseeing trolleys. The car travels a wide loop around beautiful Mount Royal and drops you off where you started. On a hot night nothing cools a person off more than a ride on one of these tiered cars. Three of the cars passed us by before one came by with room for us. There were quite a few visitors on board from New York City all talking and joking with each other—so different from their own home town!

The next morning I snapped a few Montreal Tramways pictures while Casey and Stan took in old Bonaventure Station and then we piled aboard the CP's Alouette for Woodsville, New Hampshire. A small, sleek CP Pacific, 2229, was on the head end and pulled us as far as Newport where a B & M Consolidation was coupled on for the trip to Woodsville, New Hampshire.

There we hopped off and watched while a Maine Central Diesel A unit replaced the Consolidation. We dumped our bags into lockers and walked over the bridge to Wells River, Vt. At Wells River, we had hoped to see the Montpelier & Wells River Railroad and also get a shot or two of its motive power.

We found a weed grown main line, a few sidings, a ball type signal (which was still in use) and a very ancient station. We got into a conversation with Bill Massey, the second trick operator, who told us



that the small Barre & Chelsea had bought up the larger Montpelier & Wells River and was proceeding to dieselize it. Furthermore, the old M & W P's main line was now the Barre & Chelsea main line—the original B & C was now a mere branch!

Bill Massey had been in the Regular Army for 31 years and had just recently retired. About then, he introduced us to "Boomer," a husky looking striped grey railroad cat who'd been at the Wells River Station for six years. Boomer belongs to Barney Barnard, the station agent, and travels over that section on B & M trains. One time she (he) went to White River Junction and another time to Berlin (N.H.) but Boomer always came back, and under her own power.

Bill told us that a B & C train was due shortly so we all grabbed our cameras and snapped a chunky little GE diesel, Barre & Chelsea No. 12. The train was the Sunday mixed train and on the end was an ancient combine, sagging in the middle. Since the train was going across the river back to Woodsville, we asked for a ride back and the crew obliged. Total distance, about a tenth of a mile!

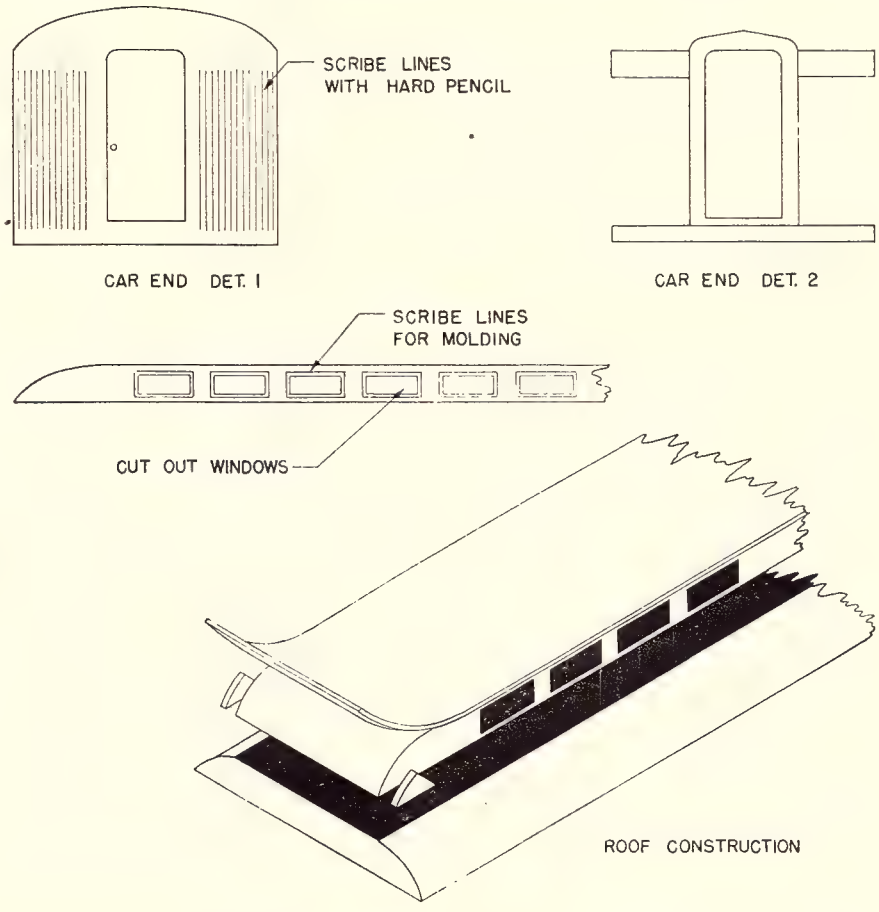
As we got off again, I spied a batch of assorted head end cars opposite the station. One was a Canadian Pacific baggage express car boasting three doors. With truss rods, monitor roof and flat ends, I thought it would make a swell model. The plans shown here were the final result. You might note the lack of diaphragms and the minimum of sanding you'll have to do on the ends of the roof.

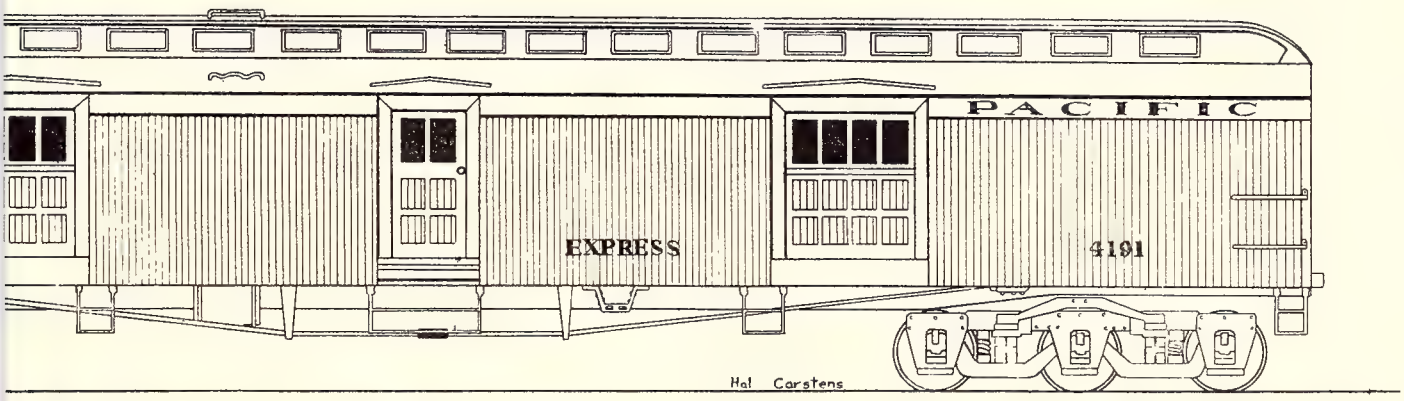
The plans are shown in full size HO gauge: The overall width is 1 3/8", length is 9 3/8" and bottom of floor to top of roof is 1 13/32". Wood and cardboard construction is often looked upon as not suitable for cars, yet a wood foundation is probably the handiest base on which to fasten the details. A good grade of bristol board, when properly scribed and painted, closely resembles a piece of metal. The sides of the car are built up from several layers of bristol board. When you scribe the sides, do a slow and careful job. All to often, the beginner in his eagerness to finish a car will slap it together instead of doing a good job and taking his time. You'll be proud to keep and display a well built model, but you'll grow tired of a botch job in very short order. The doors on the sides of the car are not flush, they are set back approximately the thickness of one ply of bristol board. Some builders prefer to "paint" their doors on with india ink however, it is a simple matter to cut the outside sheet of cardboard to fit the doors—a close look at the two types of construction will convince you.

The floor, roof and ends of the car are made of white pine, cut to the dimensions shown on the plans. Hinges can be made of cardboard with small pins or escutcheon pins for bolt heads. The roof is also scribed—the best way is to glue a piece of cardboard over the entire roof, letting the edges project slightly as the roof sheathing does on a real car. Brake wheels, trucks, end sills, coupler pockets and brake cylinders can be castings, or can be built up by various methods. Hand hold rungs, truss rods, etc. are made up of spring brass wire. Soft wire is easier to work however, it is easily bent and knocked out of shape—hard wire will give considerably and will spring back to the original position.

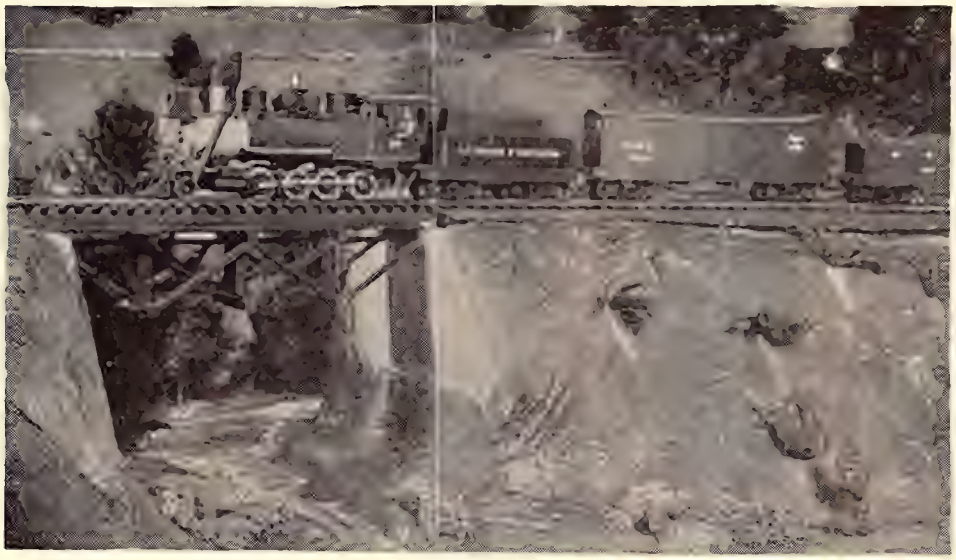
In modeling, all too often the beginner in his eagerness to finish a car will slap it together instead of doing a good job and taking his time. You'll be proud to keep and exhibit a well built, finely detailed model. A little extra work will continue to pay dividends for years.

Next month we'll take a look a little futher down the line of the B & M, CV.





She's Not As Wide . . . But!



By JACK ALEXANDER

IN the past fifteen years of model railroading there have been twelve complete systems built in my cellar. The first was in "O" gauge and in fact is still in operation. Indeed many happy hours were spent in the construction and operation of those models. It turned out in the end though, that all that work seemed to have been done as a "come-on."

It was not long until I started to think back to my younger days when I lived for a while at Montrose, Colorado and the hard working, diminutive locomotives of the old Denver & Rio Grande leaving that town with the drags of narrow gauge cars.

That did it. Soon we were figuring out how there could be a narrow gauge feeder line added to the system. That was not much of a job and it was decided to build the Timber Ridge Logging Company Railroad.

However, the first thing that had to be done was to produce a locomotive to haul the trains. Old #7, a model of one of the D.&R.G. 2-8-Os was hacked out and fitted together using any commercial parts that were on the market at that time that would fit in without looking too badly.

As the narrow gauge is built to ¼" scale, the first step was to order a well known make of "OO" mainframe and drivers. We also got a cylinder block that had to be worked over and filed to shape and went on from there.

The superstructure and the tender were all built up as were the tender trucks. This locomotive was powered with a 6 volt motor and was changed over to a new 12 volt about a year ago.

After the locomotive was found to operate correctly, two log cars were "whomped" out and loaded with logs. Then of course we needed a right of way to operate over. Ever since that day the narrow gauge has been growing. It has constantly pushed the "O" system around until the system is now about all narrow gauge . . . with the "O" for the "feeder."

It was decided at the last changing of the layout to use the "S" gauge rail. This is laid on scale ties (5"x7"x7') set on ⅜" centers. The same method of base board construction so commonly used today was followed—the use of ¼" plywood covered with black slate roofing material. The rail is then spiked down to ¾" gauge.

Westbound Passenger train at "Crooked Creek" station showing "Wye."

A Freight train crossing Crooked Creek.

Passenger train on interchange track at "Misquite Junction."

All the trackwork is done the same as in the other gauges with the exception of grades. The prototype roads ran grades as high as 7% but it has been found that 5% is about as steep as good operation will allow.

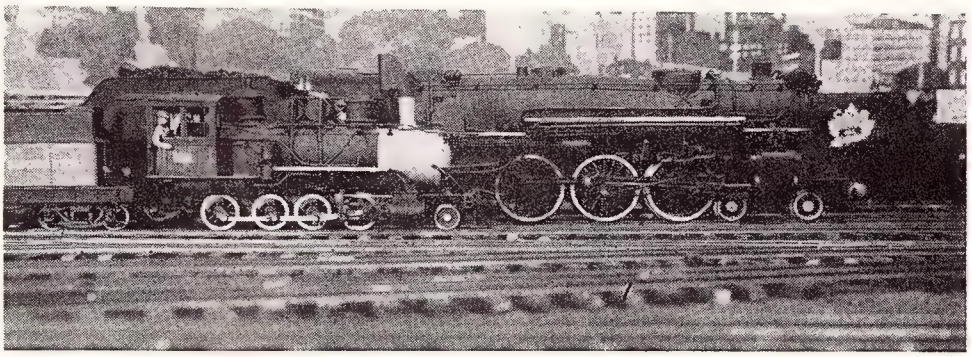
As was common years ago on the "slim gauges" the local system also has a number of stub switches. These are interesting to build as well as operate.

In the yards there is a considerable amount of dual gauge track. This is really a three rail set-up where both the narrow gauge and the standard gauge use the same line, having one rail common to both gauges. Some of this dual gauge track may be seen in one of the pictures.

The layout plan shows the extent of the system. There are 146′ of mainline, 28′ of sidings and 16′ of branchline. The main yards consist of about 30′ of track not including the engine terminal.

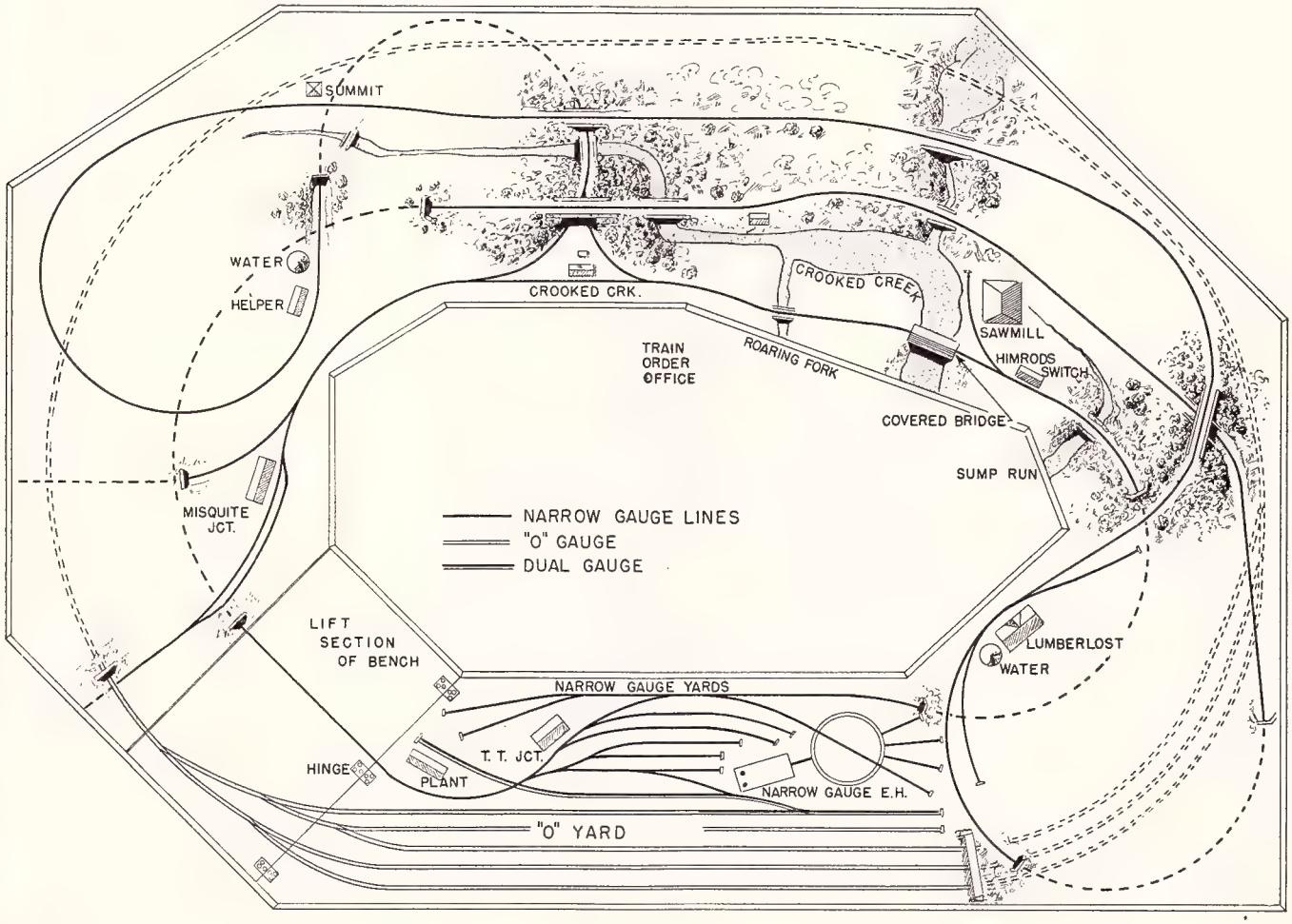
Leaving the yards both East and West the line starts to climb. Eastbound the Right of Way enters a tunnel at the yard limits and curves to the left. It comes back into the open at Himrods Switch where there is a siding laid in to a sawmill. It then crosses a short trestle and is soon entering a covered bridge the prototype of which is found at Sycamore Shoals, Tenn. on the main line of the East Tenn. & Western North Carolina R.R. Then on up the grade to the station named Crooked Creek which is located in the center of a Wye.

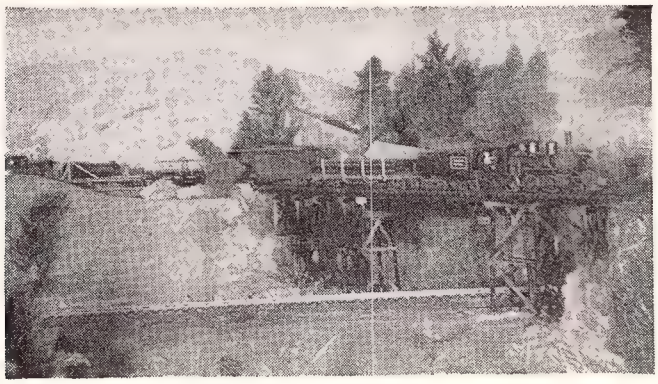
The branch line cuts off to Misquite Jct. at the Wye and the mainline curves

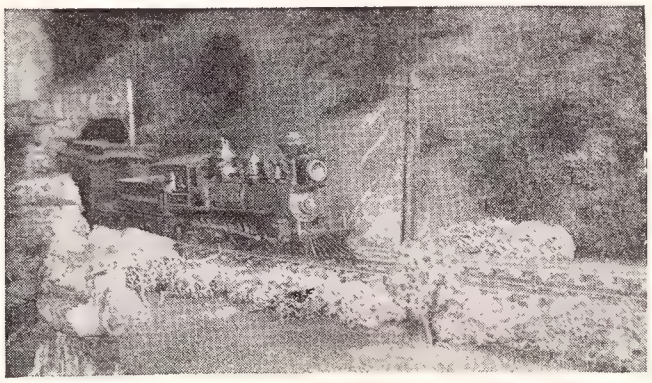


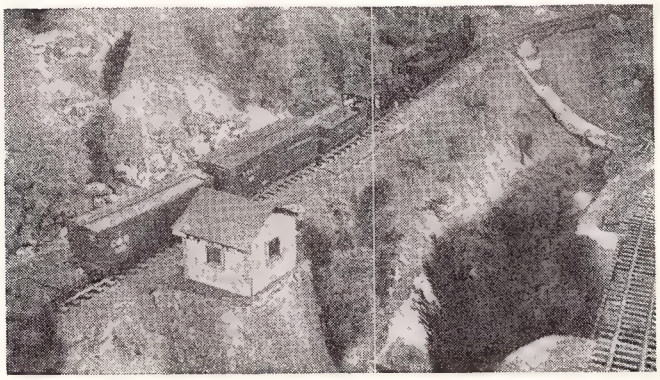
Yard view (above) showing difference in sizes of a narrow gauge and an O gauge box car. Note the dual gauge track under the O gauge car! Lower photo shows a narrow gauge 2-8-0 and an O gauge 4-6-2.

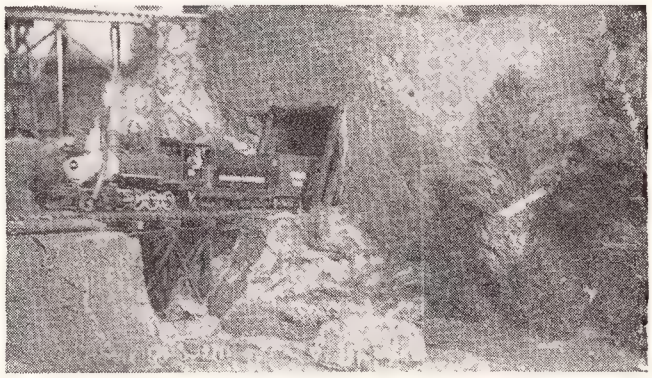
The Timber Ridge Logging Company Railroad—¼" scale, narrow gauge (3′ gauge). This two rail outfit operates on 12 volts D.C. and occupies a room 17 x 24′.











2-6-0 with freight train eastbound—nearing "Lumberlost" on the Timber Ridge Railroad.

Two D & R G 2-8-0's "Double Shot" the grade westbound, past the order office at "Roaring Fork."

Top photo shows a Westbound passenger train leaving tunnel.

Eastbound freight train crosses "Sump-Run" on the Timber Ridge Logging Company Railroad.

to the right and enters another tunnel. After reversing direction the track pops back into the open in a deep cut at the station named "Helper." This is the point where the pusher engines are cut off Eastbound.

The grade eases up here as it continues to climb to "Summit." This is the racetrack of the line and there is a long gentle sag between "Summit" and "Lumberlost." Between the latter stations the line has been following the top of Timber Ridge. It is from this ridge that the line takes it's name and from this point the logs are hauled down to the mill at "Himrods Switch."

After a long left hand curve the track starts a sharp drop that will carry it under the long trestle and down the valley to the passing siding where there is a small train order office located on the edge of a mountain stream named Roaring Fork.

At the west end of the siding we are soon into another long tunnel that will bring us out at the west end of the yards. A left curve brings us over a dual gauge crossing and into the yards at the station at "T & T Jct."

A train taking the branch line at "Crooked Creek" curves around the mountain to "Misquite Jct." where there is an interchange point with the Termite Timber Company Ry. This is another narrow gauge line running up into the mountains.

At the present time there are six locomotives, a railbus and an inspection car in operation. The locos consist of two D&RG 2-8-Os, one Colorado & Southern 2-8-0, one D&RG 4-4-0, a free-lance 2-6-0 and a diesel switcher.

The rolling stock numbers three passenger cars, 26 assorted freight cars, 2 cabooses, a working rotary snow plow and a grader car. There is a gas-electric car about completed which is locally known as "The Hornet."

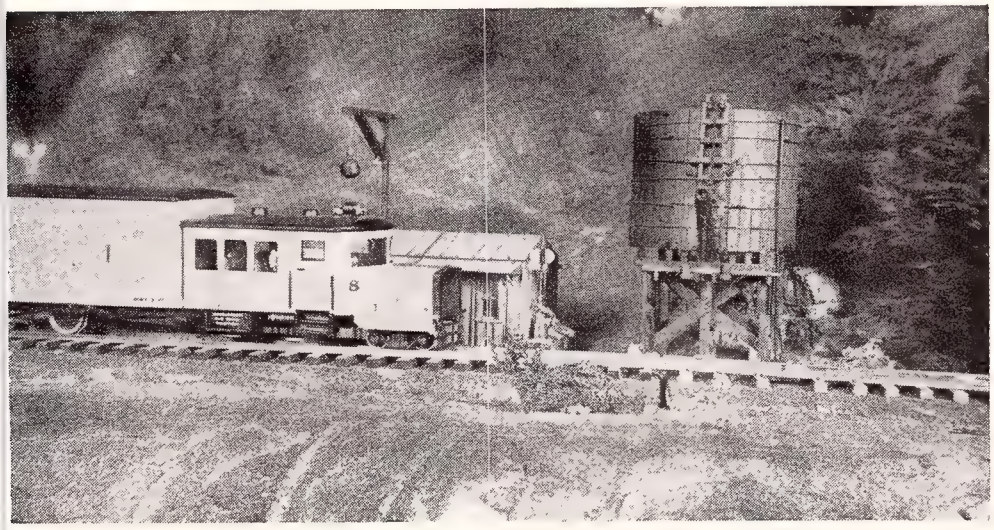
Scenery on the line was made by the method of forming ground contours with wooden framework covered with window screen which was in turn covered with wood fiber plaster. Ground colors were then painted in and the trees, bushes, fences and small detail were added last.

Several years ago a number of us interested in the narrow gauges had a meeting. The outcome was what we call the Narrow Gauge Guild. It is a group of men working in the scale who all pool information on the slim gauges and group it at one central point. For years we have made trips to the locations of the narrow gauges and collected data that we needed.

Plans of equipment have been made to scale and what commercial parts there are on the market, in addition to ties and rail, can all be had by writing to Edmund Collins, 123 West Main Street, Kutztown, Pa. and asking for the free list of narrow gauge plans and parts. This man acts as a clearing house for the narrow gaugers.

For the model rail who has a space problem to contend with it might be to

(*Continued on page* 50)



The Railbus (Goose) at "Helper." Note the "Ball Signal." Prototype of the Water Tank is at Cranberry, N. C. on the E. T. & W. N. C. R.R.

Scenery For the Model Railroad

By J. D. LISK

Model Railroads built to scale have made wonderful strides in the past few years and more so, since the firms catering to the trade are supplying all types of kits and parts. This does away with many difficulties and machine work and tends to encourage the beginner.

The very important and necessary part which nature supplies for the real railroad is often lacking in the model—in this article the writer will endeavor to give that realistic look. Imagine Norman Rockwell painting a railroad scene without putting in the background. That is what most of the model fans do. The layout is all foreground and no background.

As most of us are not artists, we stay away from scenery trying to cover up for our lack of artistic ability by constructing a few buildings in back of our stations and along the right-of-way. This is not enough. We must also put in the sky which is ever present when out doors. The trees, distant houses, farms with their red barns and unpainted sheds also catch the eye.

To put all of these things into our layout sounds like a lot of work. And in the back of our minds, we say that we can't do it because an artists brush is unruly. Because of this general misunderstanding, I will attempt to help you through this ordeal.

First we will buy the necessary supplies, buying according to our purse. Some of us can buy the best of paints and brushes on the market while others have only a few dollars for this task. Because of this, I will give first and second choices.

1. Cotton muslin, or brown wrapping paper, 24 to 36 inches wide (according to the amount desired). The length also varies to the individual layout.
2. One white wash brush at least 4" wide. The softer the bristle the better for spreading the paint and white wash on evenly.
3. White wash or distemper. Ask your supply house the approximate amount to buy. Again the area to cover governs the amount.
4. Tempra colors or show card colors. The primary colors will give you all the hues necessary. A larger bottle of white for dulling the colors for background objects.
5. Water color brushes. The finer the brush the easier they are to yield. A number five and ten would be enough. A good sable hair brush will make fine lines for real foreground work.
6. One half pound each of dry color blue, chrome yellow and red.

To get started with the scenery, lay the packing paper or unbleached cotton muslin on the floor or work bench. It must be a flat surface allowing the fluid paints and white wash to flow evenly. Apply the primer coat of wash in long even strokes across the complete length of material.

Station covered very effectively with Walthers building papers. The roof section is entirely made of cardboard. The rolling stock is not finished, but will show the effect of scenery.

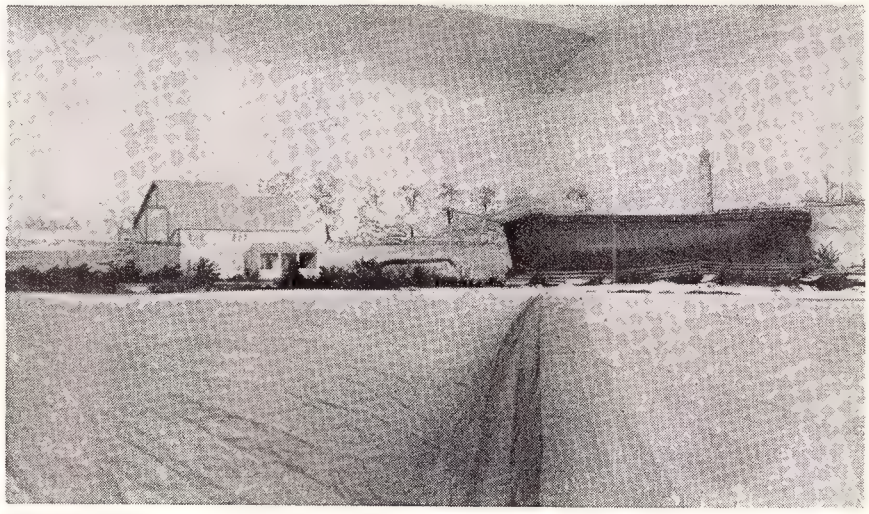
Tunnel face branch line built of wood with abutments covered with building paper (stone). The inside of the tunnel is cardboard covered with old cotton sheeting and old crumpled papers painted with glue water to stiffen the cotton. It is then painted to resemble grass or earth. Note background!

Straight line, old time house and modern bungalow in background on cotton muslin. This type of background has much more eye-appeal than a bare cellar!

When dry, it will appear streaky necessitating a second and third coat. While the third coat is still wet, sprinkle some dry color blue about six inches from the top down. Sprinkle dry chrome yellow lower down and a little red about half-way down. D pping your whitewash brush in the watery whitewash, start at the top and go the full length of the blue, more white as you meet the yellow again going full length, coming to the red which is washed full length, always using the whitewash to lighten the color. Add a little color if needed, but always wash from the top down while wet. Once it drys, no more work should be done on the painting.

Only an expert can apply fresh paint to a dry painting without leaving noticeable brush marks. By now your packing paper or unbleached cotton muslin would have a good, clear sky if nothing else. After completing this portion of the project, lift the paper to let air circulate underneath—this will prevent any wrinkles.

When the sky is complete, you will now need some background—and this is written especially for those who cannot draw or paint. The writer finds the easiest way is to keep any pictures of trees, barns, houses or scenery of every description handy and to transfer the same on to lengths of thin paper six or eight feet long by means of carbon paper. Then pin the selected parts on to your finished sky background with the carbon paper between. You now have an outline drawing on your sky, ready for the poster colors. Keep pictures or drawings by you of buildings or scenery, cliffs with ships on the horizon, clumps of trees. hills and bridges that can easily be traced by the carbon paper method to the full length of the scenery.



A corner of the room, scenery is painted right on plaster by carbon method.

Here is one method of painting water which presents a very realistic appearance. With your carbon paper, select a distant country scene with a few clumps of trees, some larger trees in the foreground and draw a line for the horizon. You now fold the drawing with your carbon paper between to get an exact replica when opened up, which will resemble a reflection. Before painting, make certain the sky is the same below as above and when painted as an exact replica, a few broken lines on the reflection will convert the "sky" to "water."

If you are handy with a coping saw, trees may be cut out and imprinted on the paper, later being touched up and shaded. Trees and hills in the distance may be touched with a little violet or blue and should be kept light and indistinct. Distance is not painted—it is better daubed.

In painting houses or any scenery, if we decide on which side the sun or light comes from, remember the shading must be on the opposite side. Shade under the eaves of all buildings, under all masses of foiliage away from the light, trunks of trees with underside of branches and ground shadows of buildings and trees. As the foreground is painted bolder, the nearer it approaches and less distinct with distance, we get the real appearance or natural setting.

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TO BE SURE . . . .

means QUALITY
In HO-OO-S gauge Right of Way
MIDLIN MODELS
Scotch Plains, New Jersey

Each month in this space the Layout Doctor will answer questions put to him in his fan mail. The questions will be reworded in the interests of brevity and clarity and attributed to a mythical person from a mythical locality since often essentially the same questions are asked by several persons. Questions not requiring extensive work will also be answered by mail if a stamped and addressed envelope is enclosed.

DOC, OL' PAL:

Either you are crazy or I am, but I get a little confused when you talk of crossings and crossovers. Can you straighten me out?

(signed) Crummy Hack, Ohio State Home for the Bald, Dismal Seepage, Ohio,

Dear Crum:

Yes, I can straighten you out so you never will get confused again. A crossover is a pair of switches connecting two parallel

$$L = 2\pi\left[\frac{W}{2} + (\text{CORE TO L.V. WDG.}) + \frac{1}{2}(\text{L.V. WDG. THICK})\right]$$

$$W = 1.25$$

$$L = 2\pi\left[\frac{1.25}{2} + .063 + \frac{.161}{2}\right]$$

$$= 4\ 83 \text{ INCHES}$$

tracks. (a) is a trailing point crossover so called because in normal right hand run-

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ning over the two tracks, the points of the switches are trailed through. In (b) the points of the switches *face* normal right hand running traffic and so it is called a facing point crossover. When the two types are overlapped, as in (c) we have what is called a scissors crossover, a good space-saver but a headache for who ever must build or maintain it. (d) is a crossing, the intersection, without switches, of two non-parallel tracks. Sometimes this is called a level crossing to make clear that the tracks cross at the same grade rather than with bridges.

Tin-plate catalogs have done a lot to confuse the two terms in the eyes of a true model rail.

Dear Pill-Roller:

What is the minimum radius curve for HO gauge track?
(signed) Dixie Flagler, Dew-Eye-Ditty, Miss.

Dear Miss Dixie:

Although N. M. R. A. Standards list 24" as the minimum radius for HO gauge, this is merely a point of reference. Generally speaking, your main line radius should be as large as possible, 36" or 48" being desirable if you want to operate long passenger cars with close coupled diaphragms. At the same time, shorter passenger cars such as Mantua's or Red Ball's old-timers will look all right on much shorter curves, say eighteen inches or even less.

Your passenger cars and locomotives are the determining factors for your minimum radius since freight rolling stock will take any curve that passenger does for the overhang from coupler to truck center is much less. In cars the amount of swivel in the trucks and in the couplers helps determine the curves the cars will negotiate without being pulled off the track. In locomotives, the length of the wheelbase of the flanged drivers (all pairs beyond two assumed to be without flanges) is one determinant, the shorter wheelbase being able to take the shorter curve. An engine with a four wheel leading truck will have a great deal of overhang at the front which may pull cars off the track when running with pilot coupler in use; an engine with a two wheel leading truck, or no leading truck at all, will cause less trouble this way. Other factors in the minimum radius an engine will take are such things as the closeness of the tender coupling and the possibilities of the pilot wheels striking the cylinder block, with or without attendant short circuits.

The best way to determine *your* minimum radius is to take *your* engine with the longest wheelbase and try it out on curves of increasingly smaller radius. Even when it reaches "bottom" you may be able by a little work to make it take a still smaller curve. Your minimum main curve should be several inches larger in radius than the minimum obtained by experimentation. All yard and engine terminal curves that this engine will have to travel should have the same minimum. However, tracks that will be travelled by freight cars and four coupled switchers only need not conform to this minimum but may have one of their own, depending on type of couplers used.

Try not to have all your main line curves just the one minimum radius but insert some larger radii if at all possible.

Dear Friend:

I am a Lehigh Valley Transit fan and would like to model that line in miniature. I was going to call on you for help until one of my friends told me that you had once tried to build a model bus line. Care to comment?
(signed) Field W. Tapp, Whales Jct., Pa.

Dear Field:

Is my face mountain-ash scarlet? Yes, not long ago I started to build a model motor bus line and in order to insure authenticity I resolved to start off with a scale smell. All the ingredients of my medical kit did not make the correct odor, nor did the resources of a large laboratory. In fact, the only thing that would do was an old motorman's glove. Since motorman's gloves are passing out of style, I felt that this was an insecure source of supply and gave the project up.

Seriously, I once did consider making a model trolley-bus line in conjunction with an O gauge model railroad. Although this idea never came to fruitation, I pass it along to my readers. Each bus would have two motors, each driving a wheel on one side only. Both motors would be grounded through metal tires or a sliding contact to a metal street. Each motor would be independently controlled by one of the two wires. Corners would be rounded by slowing down the motor on the "in" side. Wonder if it would work.

Dear Sawbones:

The Mattfeldt layout in the May Craftsman struck my fancy but there are several points I would like to question you on. (1.) in many places the track centers are only two inches from the edges of the platform. Aren't the trains likely to fall off if derailed? (2.) What is the elevation of the level crossing at right center? (3.) To what does the 4" elevation at the road overpass just above the level crossing apply? (4.) How can I get a locomotive return cross-over into the freight yard and still have long yard tracks, (5.) The text regarding the freight yard ladder track doesn't agree with the drawing. How come?
(signed) "Hot Iron" Smiff,
Anthrax, N. H.

Dear Hot Iron:

(1.) Yes, they are close. To prevent trains falling off, erect a fence. A variety of fences will lend interest. The terminal might be fenced in with cyclone type. while the right-of-way might have wooden or wire farm fencing. The easiest thing is to bend up long square U's of heavy wire about six inches long and thrust their legs into holes drilled into the edge of the platform. A more subtle way is to erect telegraph poles along the outside edge of the trackage. These may be spaced every scale fifty feet and may be interspaced with other obstructions such as whistle signs, spare rails, etc. Trees or sham buildings would serve the same purpose. (2.) The elevation of the level

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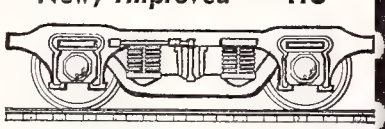

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crossing is 1" which was inadvertantly omitted from the drawing. (3.) It applies to the road because it is in the road. (4.) Run the wrecker track on into the edge track to the right of the elevation figure O" in the center. One foot from the right end of these two tracks install a facing point cross-over. Trains then arrive on the second track, the engine escapes on the first track directly to the engine house. Good, uh? (5.) Yes, this was done in the redrawing of my original plan.

Ten Years with No Club Layout

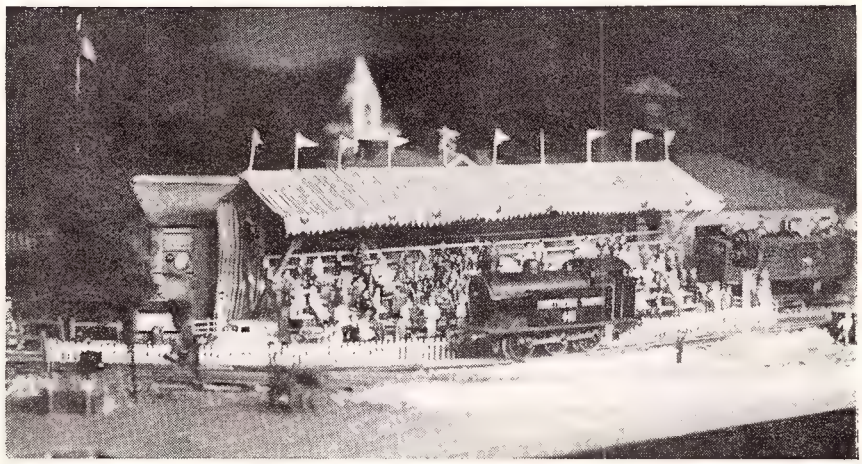
By HARRY H. KINGSTON Jr.

WHEN a group of model rails can function for ten years with no club layout, no club dues and no officers and are entering their second decade full of enthusiasm and plans for the future, they must have something on the ball!

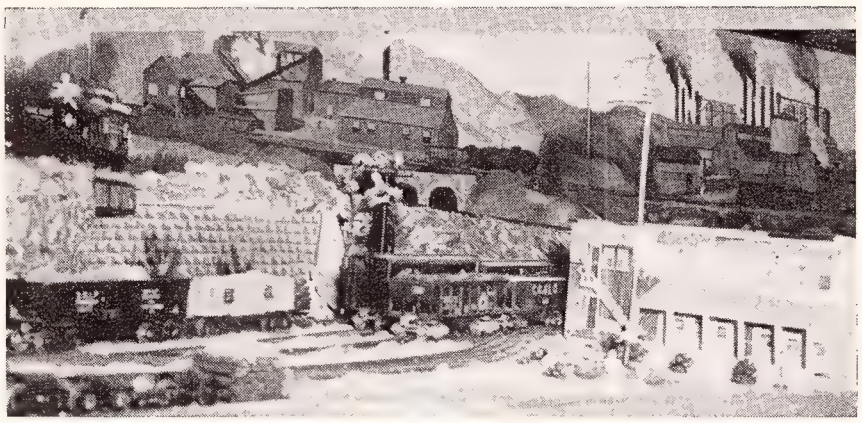
It was in 1938 that a car load of model rails drove 30 miles to Sodus, N. Y. to visit with the Reverend John S. Williamson who, in the barn hayloft of the Rectory, had an English Clockwork layout that was really something to talk about. There was a pile of leftover hay in one corner and parts of an old church organ in another, but around it, through it and over it ran these English trains. The Rev. John would give an engine just the right number of turns of the key, couple it to a train and it would rush around curves, under tunnels, over bridges and, returning to its starting station, come to a stop!

Later the same evening we adjourned to the diner in the Rectory where, over pie and coffee the idea of a group of individually owned layouts might be welded into a system and meetings held at the home of each individual.

We tried it out and it worked! Now known as the Lake Ontario System, our operation runs from Oswego, N. Y. along Lake Ontario to Charlotte (Port of Rochester) then via the Ontario Belt line to Rochester and south to the coal fields of Pennsy. These are all so called short roads, not big enough to support a deluxe passenger train, but as part of a system we each have a swank passenger train known as the Ontarian.



Action aplenty on the Lake Ontario System



All the individual layouts are in "O" gauge. Some of the boys who started with Lionel still use the inside power rail, but have discarded tinplate rail for steel or brass standard "T" rail. Two of our lines are very modern — two rail if you please! The two railers and three railers kid each other no end, but its all in fun.

A regular meeting night goes like this. Seven-thirty is the hour and that doesn't mean eight. We come from Sodus (30 miles), from Webster (12 miles) and from our own neighborhood — distance means nothing and neither does the weather. We are meeting at the Coal Glen where in the afternoon the old station stove has been fired up and train orders made out. The Coal Glen has two operating towers so that two crews can work at the same time. Two peddler trains are made up, one North and one South. When work is finished on their own division, they wait for orders to enter the other division. The "O.R.C." is responsible for his train work and gets plenty of razzing if he makes a boner. All the Hogger has to do is move his engine as instructed. A crew usually consists of a Con, a Brakeman and the Engineer. Usually the owner of the layout acts as the delayer.

Along about 8:30 an order is issued to clear the main for the Ontarian. In the interest of operation, some crew is apt to forget the clock and gum up the main. Then is when the Brownies fly!

At ten it's pie and coffee, over which we plan for the next meeting and talk railroading in general. Right now we are planning our second Fair of the Miniature Iron Horse. Copied after the Fair of the Iron Horse put on by the Baltimore and Ohio, we held our first show in 1938. Our scale grand stand needs a few repairs and our hot dog stands have become lost, but we still enjoy looking at the Kodachrome movies of the first event.

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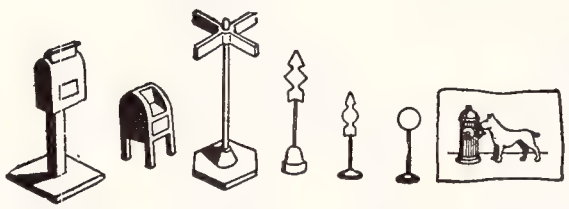

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STREAMLINED CARS

(*Continued from page* 17)

Reduced Cars for O-72

A friend who works with scale-tin plate and 0-72 track has asked me to make passenger cars for him. We agreed on two coaches and the club car of the Reading's "Wall Street." These cars are identical except that the coaches are numbered 2000 to 2002 and the club car is named "Wall Street."

Because of the relatively short radius and reduced size of the tin plate locomotives, it was necessary to make a downward adjustment from ¼" or "O" gauge scale. The dimensions of height and width were proportioned to the locomotives and the length approximates a safe maximum for 0-72 curves. By using these over all dimensions and proportioning any arrangement of windows and doors in to the outline, any prototype can readily be reduced to 0-72.

The method of construction is virtually the same as with the full "O" gauge models. However, the height of the floor above the rail will have to be adjusted to accomodate the trucks which will be used.

With the cars I have built, Lionel trucks were used with scale couplers at scale height. However, if tin plate couplers are to be used at tin plate height, it will be necessary to raise the entire car body $\frac{3}{16}$" or bottom of floor 1" above rail height instead of $\frac{13}{16}$". Also the diaphrams would have to be reduced to $\frac{1}{16}$" and fixed to car ends. They would not meet when coupled as space is needed for the coupling device on the tin plate couplers. •

Layout Limited

The following letter was received from the Layout Doctor commenting on the section of the layout described on page 38 of the July issue.

"I WAS just flipping through the July issue of the Craftsman when I came across that Prudhomme layout, or rather, *section* of a layout. Right here and now I would like to make a comment — in my humble opinion, this is a first rate example of a layout that needs no doctoring. For its purpose, yard and terminal operation in a restricted space, it is an excellent plan and as I see it, needs no remedy.

Mr. Prudhomme's idea of doctoring a section of an actual layout so that some railroading can be done will not always work out in my work for you since the patients usually submit a *whole* track plan which must be corrected or amended as a whole. However, along that line, I do usually try to indicate by a cross-hatched line which tracks I would build or correct first.

There is one danger in making, say a yard, and later incorporating it in a larger plan: the yard will dominate by the rectangularity of its table the rest of the layout, whereas in a yard designed as part of a whole layout, the body tracks may cut across a corner, or the enginehouse trackage may actually be around the corner.

To get back to Mr. Prudhomme's layout, IF this were now part of a whole layout, I would suggest that the scissors crossover at the entrance to the yard be separated into two independent cross overs; but since this is all the trackwork he had to do, and because he evidently has considerable mechanical ingenuity, I think it is a good idea to incorporate here.

To be sure, this is not the layout I would design for the space for myself, since my preferences run to four wheeled switchers, open end coaches and other short *stuff* which would permit sharper switches and

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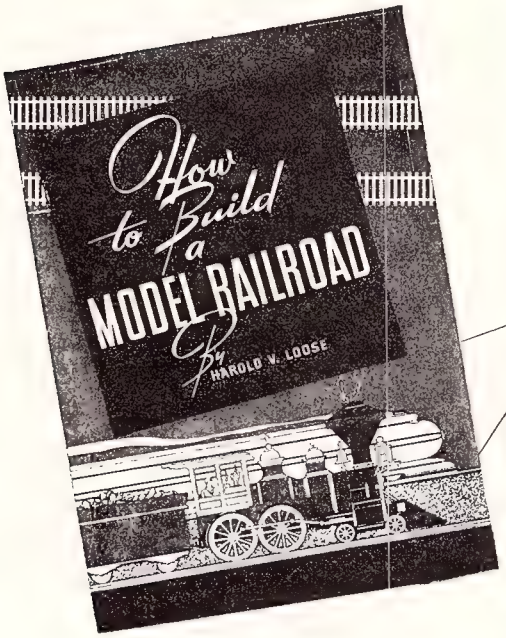

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hence more trackage. I have designed several long narrow layouts but have never sent them in to you: do you think there would be much demand for one by six foot and two by five foot plans that give plenty of operation in HO?

When Mr. Prudhomme expands his pike, I would suggest adding a second shelf in front of this one and three inches lower. Then he could turn the test track into a ramp and on the lower level have various industrial sidings leading to factories and installations under the present yard.

Yours for better railroading,

DOC.

STEAM ENGINE

(*Continued from page* 29)

of line. Loosen the side frames and adjust until there is smooth action, even though it is a little stiff.

You can now adjust the valves. For the sake of having something definite to follow, let us call the piston and valve nearest to the flywheel number one and the piston and valve farthest from the flywheel number two. When piston number one is in its uppermost position, the top of valve number two should just meet the bottom of the exhaust port opening (see stage #1, Figure 2). If it does not, loosen the hexagon nut on the valve stem and turn the valve until the correct position is obtained, then lock in position by tightening the nut against the valve stem joint. Adjust valve number one the same way with piston number two in its lowest position.

Now assemble the upper cylinder and steam chest heads. Prepare the packing for the stuffing box by saturating a piece of soft cotton string with vaseline and powdered graphite. Wrap this loosely around the piston rod between the lower cylinder head and the stuffing box and bring the stuffing box up snug by adjusting the screws

The intake flanges will accommodate any $\frac{5}{32}$ outside diameter tubing, which you can connect to your steam source and your engine is ready to run. Lubricate often with a light (#10) motor oil. (A little oil added to the water boiler will help lubricate the valves and pistons.) You will be surprised at the speed and power which you can obtain from so small an engine, and will probably find many uses for it such as driving small tools of a small generator which could supply power for your model railroad!

LAYOUT DOCTOR

(*Continued from page* 10)

starting to curve as soon as it is past the frog, which necessitates some alteration.

The enlarged area which Mr. Webb drew up for me has three rounded corners as you can see. While these may appear knobby, I do not particularly care for them. As you can see, the exigencies of a complicated yard throat forced me to cut across the concave corner curve. The curved corner by the control panel, if squared, could contain a short siding for Railway Express cars, while the corner near the words "cutback track" on the plan could contain another industrial siding of which there is a paucity. (An access space in the back would permit an industrial siding or two at Valleyton.)

One preliminary draft of this layout had the reverse loop compacted somewhat with two stub end passenger terminal tracks and two storage tracks where the passenger storage tracks now are. This, however, did not leave room for a turntable, which Webb and Marshall wanted so the present not too happy arrangement resulted: as you can see the "roundhouse" is far from round, although it will hold two road locomotives, two switchers and perhaps a Dockside. Additional length to one track could be obtained at the expense of the adjacent yard track. A little better turntable-roundhouse arrangement could be obtained by an addition to the present tablework either at the corner by the words "cutback track" or to the left of the words "passenger storage." If additional space could be obtained at the latter site, one or two feet wide and four to six feet long, a nice stub end passenger terminal could be built, the engine terminal could be transferred to the corner to the left of the controls (slightly enlarged), and the reverse loop compacted to just a two foot radius loop without any straight sections in it.

The sectionalization of the U & I pike is about as simple as possible: one section for each of the single tracks, one for each side of each of two passing tracks, one for the cutback, and one for the hidden layover track. The two sections usually needed for a reverse loop are provided by tying part of it in with each of the two lower passing tracks. One of these also controls the yards and engine terminals.

Avoid the temptation to move the control panel into the corner in front of all those switches in front of the tower. There it would inhibit reaching back to the Helper wye, while in its new location, it is very convenient for spinning the turntable and rerailing in the yards.

From Woodbridge (not to be confused with Wood Ridge), New Jersey cometh the proposed HO gauge layout of James Thomas who is changing over from TT gauge. His tablework is all built and he proposes to partially fill it with the waterwing shaped track plan shown herewith. With a slight rearrangement of switches at the narrow part of the layout, this plan would have the virtue of reversing and rereversing a train without backing up. But the yards are poorly arranged, there being but one track available for storage. Above all, the radius of the curves are too small considering the space available.

Now James doesn't specify a two level pike as Messrs. Webb and Marshall did: all he specifies is that there be no turntable. He does say that any part of his town site may be used for railroad purposes.

With all that in mind, the doc ruffled up his gray matter and came up with a very simple but effective layout plan for Thomas to build. Yes, I said simple, for though at first glance at the plan with all its notations may appear complicated, it is just a plain oval, with one passing track, and a wye leading to a small yard.

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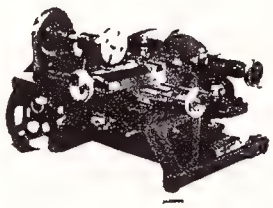

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Any yard throat necessarily has the *appearance* of a complication.

Naturally the first track that Jim should build is the main line oval. To this he should next add the long passing track and the layover track which later on will be hidden. Next would come the wye and then the yard and engine terminal. Industrial spurs can be added at any time.

Operation of this railroad line starts from the station at Port Cochere which is really at tidewater, *dontcha know*. Interchange cars are received via a car float which I have shown rather unrealistically placed in order to keep it out of the way. The wye permits a train to run around the main line in either direction and later enter the terminal from either way. In between perhaps the train will utilize the hidden layover track while another train occupies the main line. Although there is only one passing track, it would be possible to operate two trains at once in opposite directions, since that passing track is quite long. It should also be possible to operate two short trains, or one short train and a gas electric in the same direction, utilizing the siding to pass the faster one around the slower. Meanwhile another train could be hidden on the layover track and a fourth could be shifting in the yards. That is about as far as one could go in train operation so far as numbers go and surely two operators would be required.

Arriving passenger trains pull into the station track which is the long yard track nearest the depot. After passengers have left, the train backs out onto the wye where there is, in effect, a run-around track to permit the engine to get to the other end of the train and shunt it into that same station track which also must serve for passenger storage. Arriving freights stop at that run around track and run around the train to shove it into various yard tracks or at least get out of the way while a switcher does the shifting. Long freights arriving could utilize the main line passing track for the same purpose.

When the railroad trackage is done as it will inevitably be, either before or after the scenery is completed would be a good time to start building the auxiliary trolley line. If you have even the remotest intentions of ever adding a trolley line as shown, then before the railroad tracks are laid you should mark out the five inch radius reversing loop at Barnside because clearances between the main line, that loop, the yard tracks, and the engine house are critical.

The first part of the trolley line to be built would be the "main" line from Barnside around to Resort at the top of the hill. If you expect to operate two cars over the line, then a passing track should be put in as shown dotted by Green Curve station. Next can be added the branch line that runs down the main street of the metropolis of Green Curve to a loop behind the railroad freight station. Notice that this line wyes into the main line with as large a wye as can be gotten in the street; and notice also that the three switches of the wye are all sprung. The spring switches permit a through routing of one car—Barnside to Resort, Resort to Green Curve Loop, Green Curve loop to Barnside. The large size of the wye is to permit the staging of three-way meets at that site when the cars from all three termini meet. This would have to be under manual control by means of SPST switches attached to dead sections in either the track or the overhead wire. And as a matter of practical politics, the dead sections should be in the street adjacent to the wye so that waiting cars do not tie up traffic by waiting in the center of the intersection.

The Green Curve loop has a spur to the railroad freight station so that freight trolleys may have an excuse to run. The Resort loop has a spur for special cars. Likewise from Barnside loop there is a spur down to Port Cochere depot for special moves. Notice that this spur as well as the two barn tracks, and in fact every turnout on the car line has spring switches so that cars are correctly guided: switches at wye and entrances of loops are meant for forward operation, but siding switches are set so that a *backing* car takes the siding. Wire frogs can be inclined so that backing poles, even though wrongly raked will lead the car into sidings.

The passing track on the car line at Green Curve is shown dotted because it will not be needed if the wye is used as recited above. Dotted track through Barnside loop might replace the loop and its appurtenances if Jim or you would want to extend the car line and the street across the passageway to a reverse loop *under* the Resort. In this latter event, I believe I would lengthen the loop at Green Curve and place the barn inside of it, then replace the barn at Barnside with several small commercial buildings.

Additional yard tracks could be added to the line in place of the gas station, diner, etc. or at the expense of the Barnside trolley loop. The enginehouse could be shifted to the site now occupied by one of the factories.

Here is one word of caution to any prospective constructor of this layout. You must beware of reverse curves. The particular danger point is on the double track leg of the wye just under the trolley and road bridge. The railroad track coming around from Green Curve on 22" and 24" radii changes direction and curves the other way on the same radii. No, it doesn't just change direction, but *there is a short stretch of straight rail between the two opposing curves.* If this were not there, derailments would result due to couplers twisting cars off the track.

The same caution applies to the layout of Webb and Marshall's U. & I. R.R. where the principle danger points are the three legs of the wye, all of which are, but for short stretches of straight rail, reverse curves—first one way, then the other. The same caution applies also to the U. & I. yards.

It should be noted that reverse curves without the straight section are permissible on track over which only single units—such as trolleys or gas cars—are to be operated, or if cars are equipped with special "snake track" couplers which pivot at the truck centers.

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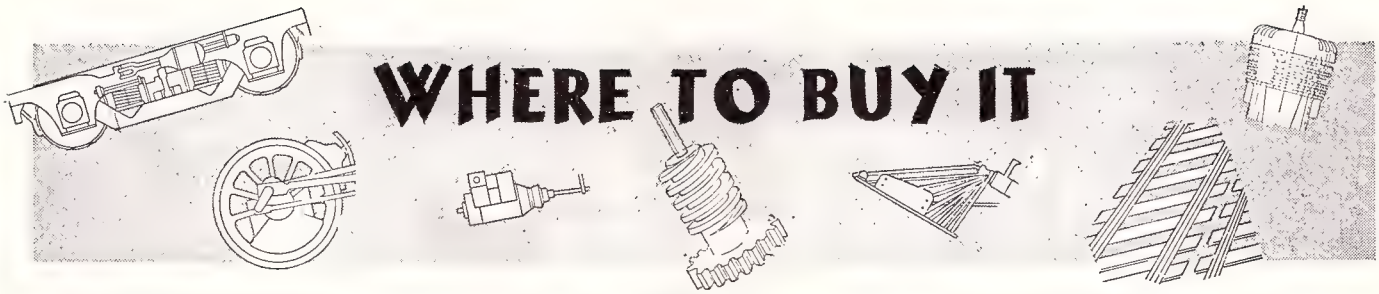

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MODEL CRAFTSMAN

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RAILROAD CLUB NEWS

(*Continued from page* 5)

been placed for standard passenger coaches in pullman green color, marked with the road's name and herald, and deliveries of the first freight cars for the Metropolitan Eastern have already been received.

The tower where operations will be controlled has been constructed and the first dispatchers already appointed. Competent engine and train crews have been named. Section gangs are at work maintaining the roadbed and tracks, while stations and freight depots are under construction.

It will be months before the entire system is completed. Meanwhile, however, trains are in operation and, with the increased rates now permitted by the Interstate Commerce Commission, it is hoped that they will be profitable. In any event, passes are now being issued to members of the public who may be interested and these may be obtained upon application to the general office of the Metropolitan Society of Model Engineers, Room 457, Union Station.

DETROIT, MICH. An International Hobby Fair will be held at Convention Hall for eight days between October 30th and November 6th. The most important categories in the hobby field will be covered including model building, home work shops, photography and handicrafts. There will be 124,000 square feet of space available for this exposition which will be under the personal management of W. S. Orkin, director of the World Hobby Show held last February in Chicago. Make your plans now to attend—full details will appear soon.

PORTLAND, OREGON. The Columbia Gorge Model R.R. Club is celebrating it's First Anniversary on October 5. Visitors will be welcome at the club rooms (2647 N. Williams Ave.) where a part of the layout will be in operation and plans for the rest of the trackwork are being laid out. Attendance has been spotty during the summer, which is to be expected, but if as much progress is made this coming year as was made in the past, this club will soon be sporting a deluxe layout.

From the fact that the club boasts 31 HO members and only four O gaugers, the club is about to be strictly HO. The O gauge boys will have to show a lot more interest if any building in O gauge is to be done. Those members who have not been coming to the clubroom are missing a lot of the fun of model railroading.

PEORIA, ILLINOIS. A new model railroad club in HO gauge has just started construction. Its location is on the second floor of 326 S. Washington St., Peoria. The club meets every Tuesday night at 7:30 and boasts 26 locos and 70 cars of all types. C. Higgins is in charge of operations assisted by D. Yerbury; the Chief Clerk is M. Scherer and Wayne Mayes is Paymaster.

N. HOLLYWOOD, CALIF. On June 25, one hundred guests helped the San Fernando Railroad Club celebrate their first birthday—everyone seemed to enjoy both the HO and O gauge layouts. This night also marked the first time trains had been run on the newly completed O gauge main line. Club operation nights are the last Monday and Friday of each month.

SAGINAW, MICHIGAN. The Saginaw Valley Railroad is slowly taking shape—very slowly that is. They can use section hands galore, landscapers and signalmen. The boys have to get down to work as they expect to play hosts to the NMRA regionals in May, 1949. Any one interested should contact the club secretary, Clarence Avery, tel. no. 21286. They guarantee you won't be sorry!

TROLLEY POLE BASES

(*Continued from page 25*)

The pin head contains an outer spring on one side while the other spring is held in place by a ball of fine wire, wrapped around the pin and slipped in place against the spring loop. Solder the ball into a solid mass, then snip off the pin end and file flat to resemble a washer.

Stearling-Meaker Base

If your favorite prototype makes use of this style trolley base, no other style will look quite right since the folded over appearance is easily distinguished even at a distance. One apparent advantage of this base is the short overhang ahead of the pivot point, thus two such bases can be mounted very close together on a short roof, a decided advantage on small steeple cab locomotives, for example. These bases were widely used and might be seen on North Shore, C&LE and Indiana RR cars, to mention a few.

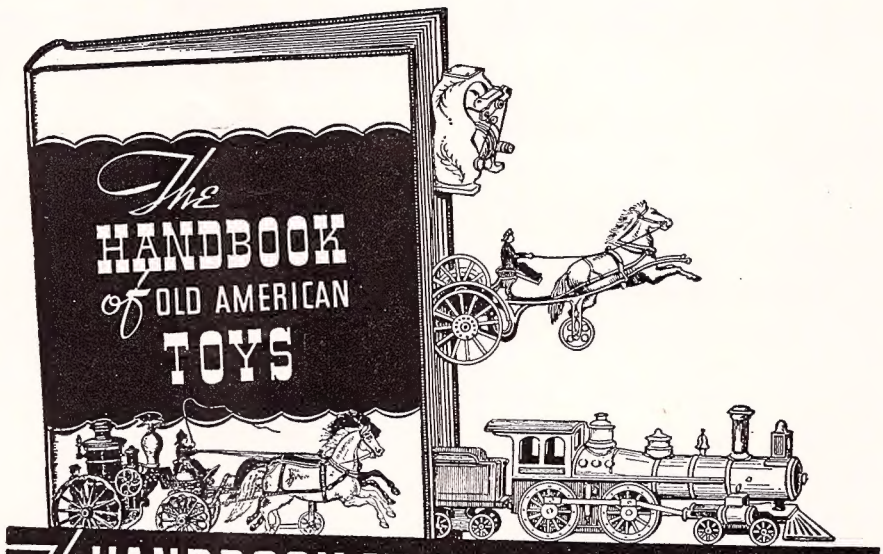
In many respects this base is a US-20 type folded over backwards. Our model employs only two tension springs for the sake of simplicity, but little is lost in appearance since the inner springs would be hidden by the fork. Required materials for construction are:

1—screw 2-56 ¾" long
2—nuts 2-56
1—cotter pin $\frac{1}{16}$" dia.
1—cotter pin $\frac{3}{32}$" dia.
1—nail, No. 20 brad.

Fig. C-1 shows the first steps in the preparation of the base pivot. Thread a nut on the 2-56 screw up against the screw head, then position the $\frac{1}{16}$" cotter pin against the nut and solder these parts together as a rigid unit. Now thread on a second nut and solder it fast at a point $\frac{1}{16}$" below the cotter pin. This bottom nut can be filed to $\frac{1}{32}$" thickness prior to installation if desired and thus lower the base a trifle. The remaining screw shank is cut off to ¼" length to serve as a pivot. Fig. C-2 shows the final work on the base pivot. File the sides of the upper nut and cotter-pin loop to an overall thickness of ⅛", then drill a No. 62 hole as indicated. Bend out the cotter pin ends to form the lower spring holder and cut off the surplus.

The pole fork is formed from a $\frac{3}{32}$" diameter cotter pin in a manner quite similar to that described for the US-11 base with the exception that the angle of bend is 60 degrees and the hinge pin hole is set on line with the bottom edge of the cotter pin. Assemble the fork to the base pivot using a No. 20 brad riveted to stay in place. Two brass springs of $\frac{3}{32}$" diameter are cut to a length that will hold the pole nearly vertical. Solder the lower spring loops to the cotter pin ends, then pass the upper loops through the pole fork holes to complete this base.

Next month the construction of the Ohio Brass Style Base and the Air Retriever Base will be described in detail.



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S. P. 0-60 SWITCHER

(*Continued from page 6*)

hole at the end of the loop and also the hole at the end of the hook are enlarged with a small round file so that they fit freely on a 2-56 screw. Be sure that the holes are large enough or the couplers will not operate satisfactorily. The loop and hook are then fastened in place in the coupler pocket with a 2-56 screw. A piece of wire is then soldered in the slot in the screw head and then soldered to one corner of the coupler pocket. This will brace the screw for it is only holding on a thread or two in the thin metal of the coupler pocket. The screw is then soldered securely where it screws into the coupler pocket. Cut off the excess length of the screw and file it flush with the top of the coupler pocket.

The front deck plate is then cut to the shape shown out of 1/64" sheet brass. Solder the deck plate in place and clean off any excess solder left on the frame. Use a three-cornered scraper to pick off the solder and save your files.

The side rods on my model are made out of $\frac{1}{32}$" thick stainless steel as are the rods on most of my models. Unlike brass which tarnishes in time the stainless steel does not rust and it stays bright. However, if you cannot obtain stainless steel you will have to settle for brass.

Before cutting and filing the rods to shape, lay out and drill the crankpin holes. The hole at the rear end of each rod will have to be drilled to fit the crankpins that were furnished with the drivers that you are using. The other holes are drilled with a $\frac{1}{16}$" drill. After the holes are drilled, cut the rods roughly to shape and then file them to their finished shape. Note that the rods are shaped so that they appear to be knuckled. This is just for appearances sake for the drivers are not sprung and it is not necessary to have knuckled rods on the model.

Put $\frac{1}{32}$" thick washers on the axles before putting on the drivers and then mount the drivers in place on the loco frame. The side rods are then mounted using 0-80 crankpin screws to fasten them to the first two pairs of drivers. Then roll the chassis along the top of your bench to make sure that the wheels turn freely and that the rods do not bind. If the rods bind take the rod off of one side and try rolling the chassis with only one rod in place. If it still binds take off the rod and file the holes slightly larger and then try it again. When you have the chassis rolling freely with one rod in place do the same with the other rod. It is important that the chassis rolls freely for if it doesn't it will cause the motor to overheat and lose power.

SHE'S NOT SO WIDE . . . BUT

(*Continued from page 36*)

your advantage to look deeper into narrow gauge model building. The models, being constructed to ¼" scale, are large enough to allow fine detail work to be done and at the same time will operate in the same average space that is generally alloted an "HO" system.

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